RICHMOND COMMUNITY COLLEGE

HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 West Hamlet Ave, Hamlet, NC 28345

PROJECT TEAM

OWNER:
RICHMOND COMMUNITY COLLEGE
Contact: Brent Barbee
1042 W. Hamlet Ave.
Hamlet, NC 28345
p 910-410-1809

TIMMONS GROUP
610 East Morehead Street , Suite 250
Charlotte, NC 28202
p 704.602.8600

adwarchitects
environmentsforlife
architecture planning interiors
2815 Coliseum Centre Drive, Suite 500
Charlotte, North Carolina 28217
p 704.379.1919 f 704.379.1920

STEWART
101 N. Tryon Street, Suite 1400
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p 704.334.7925

optima engineering
1927 S. Tryon St., Suite 300
Charlotte, NC 28203
p 704.338.1292

DRAWING SYMBOLS

ELEVATION MARK — 1 / A101 SIM — DETAIL NUMBER / SHEET NUMBER

SECTION MARK — 1 / A101 SIM

DETAIL CALLOUT MARK — 1 / A101 SIM — DETAIL NUMBER / SHEET NUMBER

COLUMN GRID REFERENCE — 0

ROOM NAME & NUMBER — ROOM NAME 808A

REVISION CLOUD & NUMBER — 1

WALL TYPE — 1

DOOR TYPE — 101

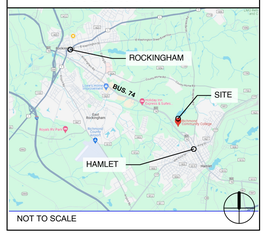
WINDOW TYPE — 1A

ELEVATION

MATCH LINE

FINISH MARK — A-A

VICINITY MAP



NOT TO SCALE

ISSUE DATES

12/18/23	SCHEMATIC DESIGN SUBMITTAL
01/18/24	50% DESIGN DEVELOPMENT SUBMITTAL
03/28/24	100% DESIGN DEVELOPMENT SUBMITTAL
05/30/24	50% CONSTRUCTION DOCUMENT SUBMITTAL
08/15/24	INITIAL CONSTRUCTION DOCUMENT SUBMITTAL
12/19/24	FINAL CONSTRUCTION DOCUMENT SUBMITTAL

RENDERING

ABBREVIATIONS

ACM	ALUMINUM COMPOSITE PANEL SYSTEM
AFF	ABOVE FINISH FLOOR
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
AUTO	AUTOMATIC
AUX	AUXILIARY
AVG	AVERAGE
BD	BOARD
BLDG	BUILDING
BOT	BOTTOM
BRG	BEARING
BTU	BRITISH THERMAL UNITS
C	CELSIUS
CB	CATCH BASIN
CJ	CONTROL JOINT
CL	CENTERLINE
CL TO CL	CENTERLINE TO CENTERLINE
CLG	CEILING
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO2	CARBON DIOXIDE
COL	COLUMN
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CST	CONCRETE STAIN
CTR	CENTER
CU FT	CUBIC FEET
CU IN	CUBIC INCH
CU YD	CUBIC YARD
DBL	DOUBLE
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DIM	DIMENSION
DS	DOWN SPOUT
DWG	DRAWING
EA	EACH
ED	EQUIPMENT DRAIN
EEJ	EXTERIOR EXPANSION JOINT
EF	EXHAUST FAN
EL	ELEVATION
ELEC	ELECTRICAL
ELEM	ELEMENTARY
ELEV	ELEVATOR
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EXP JT	EXPANSION JOINT
F	FAHRENHEIT
FAB	FABRICATE
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FED	FEDERAL
FFJ	FORMED FLOOR JOINT
FIG	FIGURE
FIN	FINISH
FIN FLR	FINISH FLOOR
FIN GRD	FINISH GRADE
FJ	FLOOR JOINT
FLR	FLOOR
FPM	FEET PER MINUTE
FPS	FEET PER SECOND
FR	FIRE RETARDANT
FT	FEET
GA	GAUGE
GAL	GALLON
GALV	GALVANIZE(D)
GEN	GENERAL
GOVT	GOVERNMENT
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
GYP BD	GYPSUM BOARD
HDW	HARDWARE
HGT	HEIGHT
HORIZ	HORIZONTAL
HR	HOUR
HVAC	HEATING, VENTILATION, A/C
IN	INCH
INFO	INFORMATION
INSUL	INSULATION
INV	INVERT
JT	JOINT
LAB	LABORATORY
LB	POUND
LH	LEFT HAND
LHR	LEFT HAND REVERSE
LL	LIVE LOAD
MAINT	MAINTENANCE
MAX	MAXIMUM
MECH	MECHANICAL
MEMO	MEMORANDUM
MEZZ	MEZZANINE
MFG	MANUFACTURE(R)
MH	MAN HOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTL	METAL
NA	NOT APPLICABLE
NEG	NEGATIVE
NIC	NOT IN CONTRACT
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OH	OPPOSITE HAND
OPP	OPPOSITE
PA	PUBLIC ADDRESS
PL	PLATE
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PRELIM	PRELIMINARY
PROJ	PROJECT
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
R (RAD)	RADIUS
RA	RETURN AIR
RD	ROOF DRAIN
REFRIG	REFRIGERATOR
REINF	REINFORCE
REQD	REQUIRED
RH	RIGHT HAND
RHR	RIGHT HAND REVERSE
SD	STORM DRAIN
SHT	SHEET
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
SQ FT	SQUARE FEET
SQ IN	SQUARE INCHES
ST	STREET
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURAL
SYM	SYMBOL
T&G	TONGUE & GROOVE
TEL	TELEPHONE
TV	TELEVISION
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VOC	VOLATILE ORGANIC COMPOUND
VOL	VOLUME
WC	WATER CLOSET

CAMPUS LOCATION PLAN

SHEET INDEX

SHEET NO.	SHEET TITLE	ISSUED	REVISION
GENERAL			
A000	COVER SHEET	No	
A001	CODE INFORMATION - APPENDIX B	No	
A002	LIFE SAFETY PLAN	No	
A003	WALL TYPES & UL DETAILS	No	
A004	UL DETAILS	No	
CIVIL			
C000	CIVIL COVER SHEET	No	
SS100	SITE SURVEY	No	
SS101	SITE SURVEY	No	
C100	EXISTING CONDITIONS & SITE DEMOLITION PLAN	No	
C200	SITE LAYOUT PLAN	No	
C300	EROSION CONTROL PHASE 1	No	
C301	EROSION CONTROL PHASE 2	No	
C400	GRADING PLAN	No	
C500	NOTES & DETAILS	No	
C501	EROSION CONTROL NOTES & DETAILS	No	
ARCHITECTURAL			
A100	FLOOR PLAN	No	
A110	ROOF PLAN	No	
A200	EXTERIOR ELEVATIONS	No	
A300	BUILDING SECTIONS	No	
A400	WALL SECTIONS & DETAILS	No	
A401	WALL SECTIONS & DETAILS	No	
A402	WALL SECTIONS & DETAILS	No	
A403	WALL SECTIONS & DETAILS	No	
A404	WALL SECTIONS & DETAILS	No	
A500	TOILET ELEVATIONS AND DETAILS	No	
A501	ENLARGED PLANS & DETAILS	No	
A600	DOOR SCHEDULE AND TYPES	No	
A601	STOREFRONT ELEVATIONS	No	
A700	FINISH LEGEND, SCHEDULE, NOTES & CODES	No	
A701	FIRST FLOOR FINISH PLAN	No	
A705	TRANSITIONS & DETAILS	No	
A800	REFLECTED CEILING PLAN & DETAILS	No	
A900	ALTERNATES	No	
A1200	SIGNAGE PLAN	No	
A1201	SIGNAGE ENLARGED PLAN & WALL GRAPHICS	No	
STRUCTURAL			
S001	GENERAL NOTES	No	
S002	ABBREVIATIONS AND SYMBOL LEGEND	No	
S100	FOUNDATION PLAN	No	
S200	ROOF FRAMING PLAN	No	
S300	SLAB ON GRADE DETAILS	No	
S301	FOUNDATION DETAILS	No	
S400	CMU DETAILS	No	
S401	CMU DETAILS	No	
S402	CMU DETAILS	No	
S500	STEEL FRAMING DETAILS	No	
S510	STEEL ROOF DETAILS	No	
S511	STEEL ROOF DETAILS	No	

SHEET NO.	SHEET TITLE	ISSUED	REVISION
PLUMBING			
P001	PLUMBING LEGEND, INDEX, AND NOTES	No	
P002	PLUMBING SCHEDULES	No	
P101	DRAINAGE PIPING FLOOR PLAN	No	
P102	PLUMBING ROOF PLAN	No	
P201	SUPPLY PIPING FLOOR PLAN	No	
P501	PLUMBING DETAILS	No	
PRS-100	ID FINISHES- PRESENTATION	No	
MECHANICAL			
M001	MECHANICAL LEGEND AND NOTES	No	
M002	MECHANICAL SCHEDULES & VENT CALCS.	No	
M003	MECHANICAL SEQUENCE & POINTS LIST	No	
M101	MECHANICAL FLOOR PLAN	No	
M102	MECHANICAL ROOF PLAN	No	
M501	MECHANICAL DETAILS	No	
M502	MECHANICAL DETAILS	No	
ELECTRICAL			
E001	ELECTRICAL LEGEND AND NOTES	No	
E002	ELECTRICAL SPECIFICATIONS	No	
E010	ELECTRICAL SITE PLAN	No	
E101	LIGHTING FLOOR PLAN	No	
E201	POWER FLOOR PLAN	No	
E301	EQUIPMENT CONNECTIONS FLOOR PLAN	No	
E302	EQUIPMENT CONNECTIONS ROOF PLAN	No	
E401	SPECIAL SYSTEMS FLOOR PLAN	No	
E601	ELECTRICAL DETAILS - PENETRATIONS & GENERAL	No	
E602	ELECTRICAL DETAILS - LIGHTING	No	
E603	ELECTRICAL DETAILS - POWER	No	
E604	ELECTRICAL DETAILS - SYSTEMS	No	
E701	ELECTRICAL DIAGRAMS	No	
E801	LIGHTING FIXTURES + MECHANICAL EQUIPMENT CONNECTION SCHEDULE	No	
E802	PANEL SCHEDULES	No	

SCO #22-25472-01A
NCCCS #2689

BID DOCUMENTS

COVER SHEET

DATE: 3/3/2025
PROJECT NO: 23014
REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
A000

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
(except 1 and 2-family dwellings and townhouses)
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: RCC HENDRICK CENTER FOR AUTOMOTIVE TRAINING
Address: 1042 Hamlet Ave, Hamlet, NC **Zip Code:** 28345
Owner or Authorized Agent: Brent Barbee **Phone:** 910-410-1809
E-mail: BTBarbee@richmondcc.edu
Owned By: [X] City/County [ ] Private [ ] State
Code Enforcement Jurisdiction: [ ] City: ______ [X] County: Richmond [X] State

CONTACT:

DESIGNER	FIRM	NAME	LICENSE#	TELEPHONE	E-MAIL
Architectural	ADW Architects, pa	James Powell	5454	704-379-1919	jpowell@adwarchitects.com
Civil	Timmons Group	Brian Crutchfield	34288	919-866-4505	brian.crutchfield@timmons.com
Electrical	Optima Engineering	Brandon Miller	28297	704-338-1292	bmiller@optimaengineering.com
Fire Alarm	Optima Engineering	Brandon Miller	28297	704-338-1292	bmiller@optimaengineering.com
Plumbing	Optima Engineering	George Fowler III	26023	704-338-1292	gfowler@optimaengineering.com
Mechanical	Optima Engineering	Ron Almond	17228	704-338-1292	ralmond@optimaengineering.com
Sprinkler-Standpipe					
Structural	Stewart Engineering	Kirsten A Baldwin Metzger	36929	704-909-3523	kbaldwin@stewartinc.com
Retaining Walls>5' High					
Other					

2018 NC BUILDING CODE: [X] New Building [ ] Shell/Core [ ] 1st Time Interior Completions
[ ] Addition [ ] Phased Construction - Shell Core

2018 NC EXISTING BUILDING CODE: (check all that apply)
[ ] Prescriptive [ ] Alteration Level I [ ] Historic Property
[ ] Repair [ ] Alteration Level II [ ] Change of Use
[ ] Chapter 14 [ ] Alteration Level III

CONSTRUCTED: ______ **CURRENT OCCUPANCY(S): (Ch. 3)** ______
RENOVATED: ______ **PROPOSED OCCUPANCY(S): (Ch 3)** ______

RISK CATEGORY: (Table 1604.5): **Current:** N/A **Proposed:** Risk Category II

BASIC BUILDING DATA:

Construction Type: (check all that apply) [ ] I-A [ ] II-A [ ] III-A [ ] IV [ ] V-A [ ] I-B [X] II-B [ ] III-B [ ] V-B
Sprinklers: [X] No [ ] Partial [ ] Yes [ ] NFPA 13 [ ] NFPA 13R [ ] NFPA 13D
Standpipes: [X] No Class [ ] I [ ] II [ ] III [ ] Wet [ ] Dry
Primary Fire District: [X] No [ ] Yes Flood Hazard Area: [X] No [ ] Yes
Special Inspections Required: [X] No [ ] Yes

Gross Building Area:

Floor	Existing (sq ft)	New (sq ft)	Sub-Total
6th Floor			
5th Floor			
4th Floor			
3rd Floor			
2nd Floor			
Mezzanine			
1st Floor		9,885	9,885
Basement			
TOTAL			9,885

ALLOWABLE AREA

Primary Occupancy Classifications (s):
- Assembly [ ] A-1 [ ] A-2 [ ] A-3 [ ] A-4 [ ] A-5
- Business [X]
- Educational [ ]
- Factory [ ] F-1 Moderate [ ] F-2 Low
- Hazardous [ ] H-1 Detonate [ ] H-2 Deflagrate [ ] H-3 Combust [ ] H-4 Health [ ] H-5 HPM
- Institutional [ ] I-1 [ ] I-2 [ ] I-3 [ ] I-4
  - I-1 Condition [ ] 1 [ ] 2
  - I-2 Condition [ ] 1 [ ] 2
  - I-3 Condition [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
- Mercantile [ ]
- Residential [ ] R-1 [ ] R-2 [ ] R-3 [ ] R-4
- Storage [X] S-1 Moderate [ ] S-2 Low [ ] High-Piled
  [ ] Parking Garage [ ] Open [ ] Enclosed [X] Repair Garage
- Utility & Miscellaneous [ ]

Accessory Occupancies Classification(s): Storage, Mechanical
Incidental Uses (509):
This separation is not exempt as a Non-Separated Use (see exceptions).
Special Uses (Chapter 4 - List Code Sections):
Special Provisions: (Chapter 5 - List Code Sections):
Mixed Occupancy: [X] Yes [ ] No Separation: 2HR. Exception:

[ ] **Non-Separated Use** (508.3)
[X] **Separated Use** (508.4) - See below for area calculations for each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

$$\frac{5,395}{23,000} + \frac{4,490}{17,500} \leq 1$$

Story	Description and Use	(A) Bldg Area per Story (actual)	(B) Table 506.2[4] Area	(C) Area for Frontage Increase[1,5]	(D) Allowable Area per Story or Unlimted[2,3]
1	S1	4,490	17,500	13,125	30,625
1	BUSINESS	5,395	23,000	17,250	40,250
TOTAL USED	S1, BUSINESS	9,885	17,500	13,125	30,625

(1) Frontage area increases from Section 506.2 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = 474 (F)
b. Total Building Perimeter = 474 (P)
c. Ratio (F/P) = 1 (F/P)
d. W = Minimum width of public way = 30 (W)
e. Percent of frontage increase I = 100(F/P-0.25) x W/30 = 75 (%)
(2) Unlimited area applicable under conditions of Section 507.
(3) Maximum Building Area = total number of stories in the building x D (maximum 3 stories) (506.2).
(4) The maximum area of open parking garages must comply with Table 406.5.4. The maximum area of air traffic control towers must comply with Table 412.3.1.
(5) Frontal increase is based on unsprinklered area value in Table 506.2.

ALLOWABLE HEIGHT

	Allowable	Shown on Plans	Code Reference
Building Height in Feet (Table 504.3)	Feet 55	Feet 23	
Building Height in Stories (Table 504.4)	Stories 2	Stories 1	

[1] Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.

FIRE PROTECTION REQUIREMENTS

Building Element	Fire Separation Distance (feet)	Rating Req'd	Rating Provided (w/ ___* reduction)	Detail # and Sheet #	Design # for Rated Assembly	Sheet # for Rated Penetration	Sheet # for Rated Joints
Structural Frame, including columns, girders and trusses		0	0				
Bearing walls							
Exterior							
North		0	0				
East		0	0				
West		0	0				
South		0	0				
Interior							
Non-Bearing walls and partitions							
Exterior							
North		0	0				
East		0	0				
West		0	0				
South		0	0				
Interior walls and partitions		0	0				
Floor construction including support beams and joists		0	0				
Floor Ceiling Assembly							
Columns Supporting Floors							
Roof construction including support beams and joists		0	0				
Roof Ceiling Assembly							
Columns Supporting Roof		0	0				
Shaft Enclosures - Exit		N/A					
Shafts Enclosures - Other		0	0				
Corridor Separation		0	0				
Occupancy/Fire Barrier Separation		2	2	A003/A004	U905/U419	A003	N/A
Party/Fire Wall Separation		0	0				
Smoke Barrier Separation		0	0				
Smoke Partition		0	0				
Tenant/Dwelling Unit/Sleeping Unit Separation		N/A					
Incidental Use Separation		N/A					

* Indicate section number permitting reduction

PERCENTAGE OF WALL OPENING CALCULATIONS

Fire Separation Distance (Feet) from Property Lines	Degree of Openings Protection (Table 705.8)	Allowable Area (%)	Actual Shown on Plans (%)
South (>30')	NO LIMIT		
East (>30')	NO LIMIT		
West (>30')	NO LIMIT		

LIFE SAFETY SYSTEM REQUIREMENTS

Emergency Lighting: [X] Yes [ ] No
Exit Signs: [X] Yes [ ] No
Fire Alarm: [X] Yes [ ] No
Smoke Detection Systems: [X] Yes [ ] No
Carbon Monoxide Detection: [ ] Yes [X] No

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: A002

- [X] Fire and/or smoke rated wall locations (Chapter 7)
- [X] Assumed and real property line locations (if not on the site plan)
- [ ] Exterior wall opening area with respect to distance to assumed property lines (705.8)
- [X] Occupany Use for each area as it relates to occupant load calculation (Table 1004.1.2)
- [X] Occupant loads for each area
- [X] Exit access travel distances (1017)
- [X] Common path of travel distances (1006.2.1 & 1006.3.2 (1))
- [ ] Dead end lengths (1020.4)
- [X] Clear exit widths for each exit door
- [X] Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.3)
- [X] Actual occupant load for each exit door
- [ ] A seperate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
- [X] Location of doors with panic hardware (1010.1.10)
- [ ] Location of doors with delayed egress locks and the amount of delay (1010.1.9.7)
- [ ] Location of doors with electromagnetic egress locks (1010.1.9.9)
- [ ] Location of doors equipped with hold-open devices
- [ ] Location of emergency escape windows (1030)
- [X] The square footage of each fire area (202)
- [ ] The square footage of each smoke compartment for Occupancy Classification I-2 (407.5)
- [ ] Note any code exceptions or table notes that may have been utilized regarding the items above

ACCESSIBLE DWELLING UNITS (1107)

N//A

TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED

ACCESSIBLE PARKING (1106)

SEE CIVIL DRAWINGS

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES: REQUIRED	TOTAL # OF PARKING SPACES: PROVIDED	# OF ACCESSIBLE SPACES PROVIDED: REGULAR WITH 5' ACCESS AISLE	VAN SPACES WITH 132" ACCESS AISLE	VAN SPACES WITH 8' ACCESS AISLE	TOTAL # ACCESSIBLE PROVIDED
PRIMARY	11	132	2		3	5
					0	0
TOTAL	11	132	2		3	5

PLUMBING FIXTURE REQUIREMENTS TABLE (2902.1)

Use		Waterclosets Male	Waterclosets Female	Waterclosets Unisex	Urinals	Lavatories Male	Lavatories Female	Lavatories Unisex	Showers/ Tubs	Drinking Fountains Regular	Drinking Fountains Accessible
Space	Existing										
	New	2	3		1	3	3			1	1
	Required	2	3		1	3	3			1	1

SPECIAL APPROVALS

Special approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, etc., describe below
NC State Construction Office, Richmond County

ENERGY SUMMARY

ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs annual energy cost for the proposed design.

Existing building envelope complies with code: 2018 NC Energy Conservation Code

Exempt Building: N Provide code or statutory reference:

Climate Zone: 3A

Method of Compliance: PRESCRIPTIVE
(If "Other" specify source here)

THERMAL ENVELOPE (Prescriptive method only)

Roof/ceiling Assembly (each assembly)
Description of assembly: 1-PLY, PVC ROOF SYSTEM ON 1/2" COVERBOARD, 6" RIGID POLYISO INSULATION ON 1 1/2" METAL DECK
U-Value of total assembly: 0.023
R-Value of insulation: 43.2
Skylights in each assembly:
U-Value of skylight:
Total square footage of skylights in each assembly:

Exterior Walls (each assembly)
Description of assembly: 5/8" GYP ON 1" FURRING W/ 1" RIGID INSULATION, 8" CMU, 2" SPRAY-APPLIED INSULATION, 2" AIR GAP, (4" BRICK VENEER OR 1" METAL PANELS)
U-Value of total assembly: 0.044
R-Value of insulation: R-6.5+R-14CI
Openings (windows or doors with glazing)
U-Value of assembly: OVERHEAD DOORS - 0.125, SWING DOORS - 0.4, WINDOWS 0.393
Solar heat gain coefficient: WINDOWS - 0.23
projection factor: WINDOWS - 0.714
Door R-Values:

Walls below grade (each assembly)
Description of assembly:
U-Value of total assembly:
R-Value of insulation:

Floors over unconditioned space (each assembly)
Description of assembly:
U-Value of total assembly:
R-Value of insulation:

Floors slab on grade
Description of assembly: 4" AND 6" CONCRETE ON 4" STONE
U-Value of total assembly: 0.39-0.37
R-Value of insulation:
Horizontal/vertical requirement:
slab heated:

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
STRUCTURAL DESIGN
(PROVIDE ON SHEET 1 OR 2 OF THE STRUCTURAL SHEETS IF APPLICABLE)

SEE STRUCTURAL DRAWINGS

DESIGN LOADS:

Importance Factors: Wind (I_W) 1.0; Snow (I_S) 1.0; Seismic (I_E) 1.0
Live Loads: Roof: 20 psf; Mezzanine: N/A psf; Floor: 100 psf
Ground Snow Loads: 10 psf
Wind Load: Basic Wind Speed: 116 mph (ASCE-7); Exposure Category B

SEISMIC DESIGN CATEGORY: [ ] A [ ] B [X] C [ ] D
Provide the following Seismic Design Parameters:
Risk Category: (Table 1604.5) [ ] I [X] II [ ] III [ ] IIII
Spectral Response Acceleration: Ss= 28.7 %g S1= 11.6 %g
Site Classification (ASCE-7) [ ] A [ ] B [ ] C [X] D [ ] E [ ] F
Data Source: [X] Field Test [ ] Presumptive [ ] Historical Data
Basic structural system (check one)
[X] Bearing Wall [ ] Dual w/ Special Moment Frame
[ ] Building Frame [ ] Dual w/ Intermediate R/C or Special Steel
[ ] Moment Frame [ ] Inverted Pendulum
Analysis Procedure: [ ] Simplified [X] Equivalent Lateral Force [ ] Dynamic
Architectural, Mechanical, Components anchored? [X] Yes [ ] No

LATERAL DESIGN CONTROL: Earthquake [ ] Wind [X]

SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) 2,500 psf
Presumptive Bearing capacity N/A psf
Pile size, type, and capacity N/A

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
MECHANICAL DESIGN
(PROVIDE ON THE MECHANICAL SHEETS IF APPLICABLE)

SEE MECHANICAL DRAWINGS

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Thermal Zone:
winter dry bulb:
summer dry bulb:

Interior design conditions
winter dry bulb:
summer dry bulb:
relative humidity:

Building heating load:

Building cooling load:

Mechanical Spacing Conditioning System
Unitary
description of unit:
heating efficiency:
cooling efficiency:
size category of unit:
Boiler
Size category. If oversized, state reason:
Chiller
Size category. If oversized, state reason:

List equipment efficiencies:

2018 APPENDIX B
BUILDING CODE SUMMARY FOR ALL COMMERCIAL PROJECTS
ELECTRICAL DESIGN
(PROVIDE ON THE ELECTRICAL SHEETS IF APPLICABLE)

SEE ELECTRCIAL DRAWINGS

ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance:
Energy Code: [ ] Perscriptive [ ] Performance
ASHRAE 90.1: [ ] Perscriptive [ ] Performance

Lighting schedule (each fixture type)
lamp type required in fixture
number of lamps in fixture
ballast type used in the fixture
number of ballasts in fixture
total wattage per fixture
total interior wattage specified vs. allowed (whole building or space by space)
total exterior wattage specified vs. allowed

Additional Efficiency Package Options
(When using the 2018 NCECC; not required for ASHRAE 90.1)
- [ ] C406.2 More Efficient HVAC Equipment Performance
- [ ] C406.3 Reduced Lighting Power Density
- [ ] C406.4 Enhanced Digital Lighting Controls
- [ ] C406.5 On-Site Renewable Energy
- [ ] C406.6 Dedicated Outdoor Air System
- [ ] C406.7 Reduced Energy Use in Service Water Heating

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SCO #22-25472-01A
NCCCS #2689

RICHMOND COMMUNITY COLLEGE

HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 West Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

CODE INFORMATION - APPENDIX B

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

JAMES GILMORE POWELL REGISTERED ARCHITECT 5454 NORTH CAROLINA CHARLOTTE, N.C. 3-3-2025
ADW ARCHITECTS, P.A. CORPORATE SEAL 50223 NORTH CAROLINA

SHEET NUMBER
A001

HAZARDOUS MATERIALS INVENTORY STATEMENT

Location of Chemicals: (Check One)	
Inside	X
Outside	
This Statement Applies To: (Check One)	
Use Open	
Use-Close	
Storage	X

Business name: Richmond Community College

Address: 1042 West Hamlet Ave, Hamlet, NC 28345

HAZARD CLASS	COMMON TRADE NAME	CHEMICAL NAME, COMPONENTS, AND CONCENTRATION	CAS NO.	PHYSICAL STATE	QUANTITY ON HAND	UNITS	NFPA CLASSIFICATION
Combustible Liquid-Class IIIB	5W-30 Syn Motor Oil	Base Oil	64742-54.7	Liquid	275	gallons	2-1-0
Combustible Liquid-Class IIIB	5W-30 Motor Oil	Base Oil	92062-09-4	Liquid	275	gallons	2-1-0
Flammable Liquid-Class IB	Brake Cleaner	Toluene-NA	108-88-3	Liquid	4	gallons	2-3-1
		Methylene Chloride	75-09-2				
		Methanol	67-56-1				
		Carbon Dioxide	124-38-9				
Combustible Liquid-Class II,	Fuel Additive	Distillates, Hydrotreated Light, <45%	64742-47-8	Liquid	1	gallons	1-2-0
Toxic Material-Class IID		Stoddard Solvent, <30%	8052-41-3				
		Solvent Naptha, Light Aromatic, 10-20%	64742-95-6				
		Benzene, 1,2,4-trimethyl-, 1-5%	95-63-6				
Combustible Liquid-Class IIIB	Brake Fluid	2-(2-(2-butoxyethoxy)ethoxy)ethanol, 1-5%	143-22-6	Liquid	2	gallons	1-1-0
		2-(2-methoxythoxy)ethanol, 1-5%	111-77-3				
		1,1-iminodipropan-2-ol,1-5%	110-97-4				
Combustible Liquid-Class IIIB	Transmission Fluid	Base Oil	92062-09-4	Liquid	10	gallons	2-1-0
Combustible Liquid-Class IIIB	Anti-Seize Compound	Copper, as Dust or Fume, 20-30%	7440-50-8	Liquid	0.5	gallons	1-2-0
		Aluminum, as Dust or Fume, 5-8%	7429-90-5				
		Petroleum Oil, 40-60%	64742-65-0				
Combustible Liquid-Class IIIB	Gear Oil	Base Oil	92062-09-4	Liquid	5	gallons	1-1-0
Flammable Liquid-Class IB	Windshield Washer Fluid	Methyl Alcohol, >99%	67-56-1	Liquid	1	gallons	1-3-0
Flammable Liquid-Class IB	Silicone Spray	Isoparaffinic Hydrocarbon, 50-55%	64742-47-8	Liquid	1	gallons	2-3-0
		Poly, 1-5%	63148-62-9				
		Propane, 10-15%	74-98-6				
Combustible Liquid-Class IIIB	Power Steering Fluid	Hydrotreated Light Paraffinic Distillate,20-30%	64742-55-8	Liquid	2	gallons	1-1-0
		Lubricating Oils, C24-50, Solvent, 5-10%	101316-72-7				
Combustible Liquid-Class IIIB	PAG Lubricant	Polyoxoalkylene Glycol Ether Plus Additives, <100%	NA	Liquid	0.25	gallons	1-0-0
		Trilsyl Phosphate, <5%	1330-78-5				
Toxic, Irritant	Coolant	Ethylene Glycol, 85-94%	107-21-1	Liquid	24	gallons	1-1-0
		Diethylene Glycol	111-46-6				
		Hydrated Inorganic Acid, Organic Acid Salts, <5%	NA				
		Water, <5%	7732-18-5				

HAZARDOUS MATERIAL INVENTORY STATEMENT | 12" = 1'-0" | 2

OCCUPANT LOAD CALCULATION

NUMBER	NAME	OCCUPANCY	AREA	LOAD FACTOR	OCCUPANT LOAD
101	MAIN LOBBY	Assembly/Standing	564 SF	15	38
102	ADMIN	Business Areas	382 SF	100	4
103	OFFICE	Business Areas	132 SF	100	2
104	OFFICE	Business Areas	132 SF	100	2
105	CORRIDOR	Business Areas	587 SF	100	6
106	MEN'S	Business Areas	196 SF	100	2
107	WOMEN'S	Business Areas	196 SF	100	2
108	ELECT	Acc. Stor./Mech.	104 SF	300	1
109	JAN	Acc. Stor./Mech.	82 SF	300	1
110	AUTO SIM LAB A	Educational - Shops/Labs	903 SF	50	19
111	AUTO SIM STORAGE	Acc. Stor./Mech.	331 SF	300	2
112	AUTO SIM LAB B	Educational - Shops/Labs	857 SF	50	18
113	EQUIP STOR	Acc. Stor./Mech.	309 SF	300	2
114	LIFT BAYS	Educational - Shops/Labs	4033 SF	50	81
115	TOOLS	Acc. Stor./Mech.	152 SF	300	1
Grand total					181

Required Plumbing Fixture Counts

Occupancy Classification: **B - Business**

	Men	Women
Occupants:	92	92
Water Closets:		
1st 25:	1	1
2nd 25:	1	1
Above 50:	1	1
Total:	3	3
Lavatories:		
1st 40:	1	1
2nd 40:	1	1
Above 80:	1	1
Total:	3	3
Drinking Fountains:		
1 per 100:	1	1

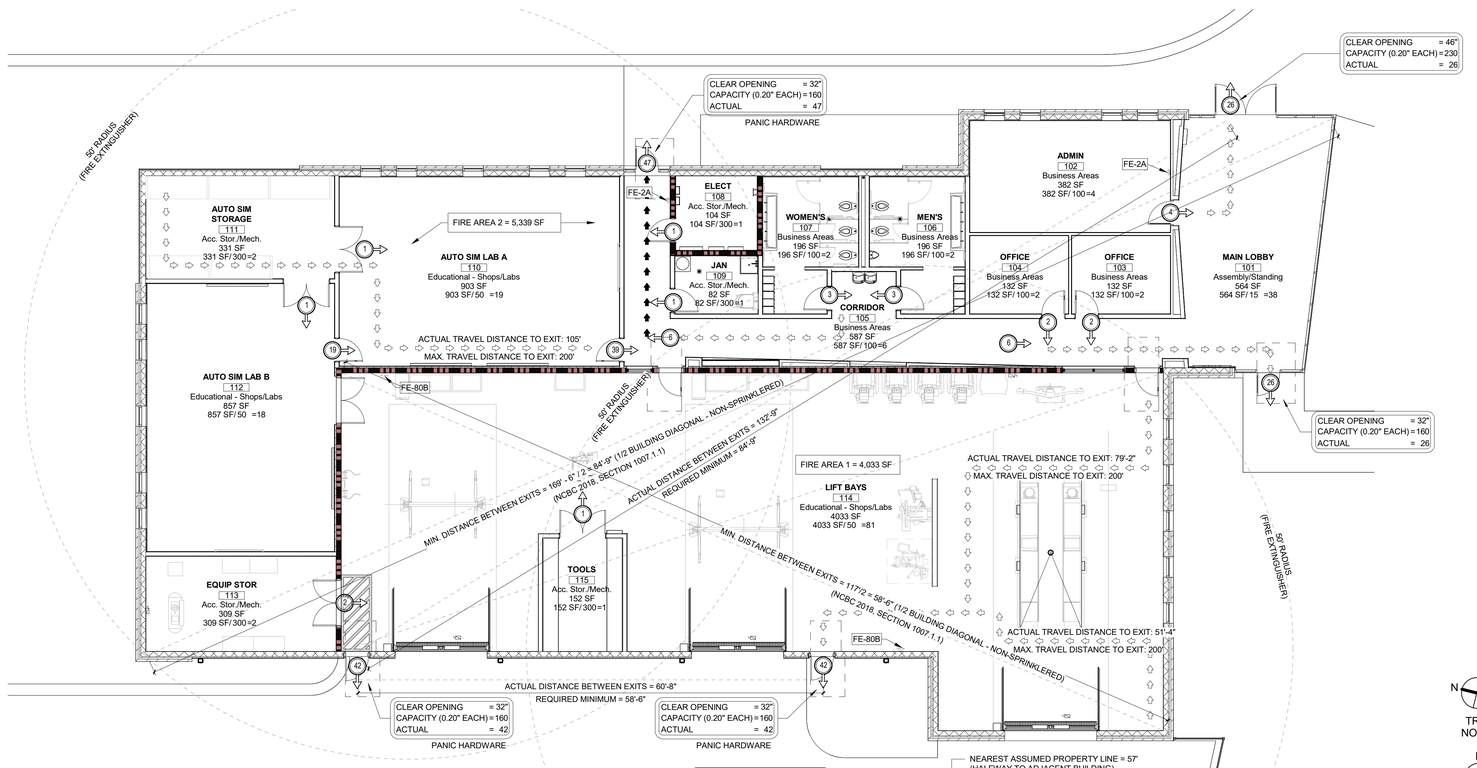
LIFE SAFETY PLAN LEGEND:

- COMMON PATH OF TRAVEL DISTANCE
- MAXIMUM TRAVEL DISTANCE
- n = MAXIMUM NUMBER OF OCCUPANTS, CALCULATED PER TABLE 1004.1
- FE-2A — FIRE EXTINGUISHER, WALL-MOUNTED, UL RATED 2-A, MIN.
- FE-80B — FIRE EXTINGUISHER, WALL-MOUNTED, UL RATED 80-B, MIN.

NOTE: SEE SPECS FOR EXTINGUISHERS. SEE ELECTRICAL DRAWINGS FOR EXIT SIGNS AND EMERGENCY LIGHTING.

WALL RATING LEGEND:

2 HOUR RATED FIRE BARRIER, SEE UL U905 / U419



LIFE SAFETY PLAN | 1/8" = 1'-0" | 1

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1042 West Hamlet Ave, Hamlet, NC 28345

BID DOCUMENTS

LIFE SAFETY PLAN

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

3-3-2025

SHEET NUMBER

A002

UL Product iQ®

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XHEZ - Through-penetration Firestop Systems
XHEZ7 - Through-penetration Firestop Systems Certified for Canada

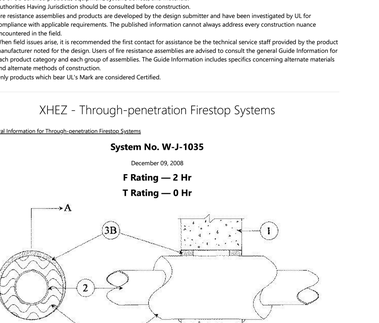
See General Information for Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems Certified for Canada

System No. W-J-7005

August 23, 2011

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F Rating — 2 Hr	F Rating — 2 Hr
T Rating — 0 Hr	FT Rating — 0 Hr
	FH Rating — 2 Hr
	FTH Rating — 0 Hr



Section A-A

1. **Wall Assembly —** Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/m^3) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 25-1/2 in. (648 mm). See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Steel Duct —** Max 24 in. (610 mm) diam No. 28 gauge (or heavier) galv steel vent duct or No. 26 gauge (or heavier) spiral wound galv steel duct. One steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 0 in. (0 mm, point contact) to max 1-1/2 in. (38 mm) is required within the firestop system. Steel duct to be rigidly supported on both sides of the wall assembly.

3. **Fill, Void or Cavity Material* — Sealant —** Min 5/8 in. (16 mm) thickness of fill material applied within annulus, flush with both surfaces of wall. At the point contact location between through penetrant and concrete, a min 3/8 in. (10 mm) diam bead of fill material shall be applied at the through penetrant/concrete interface on both surfaces of wall.
SPECIFIED TECHNOLOGIES INC — SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2011-08-23

UL DETAIL W-J-7005 | NTS | 6

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BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States
BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

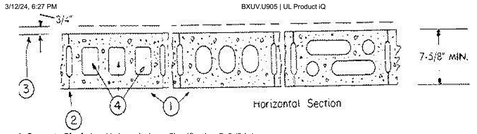
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

Design No. U905

April 14, 2023

Bearing Wall Rating — 2 HR.
Nonbearing Wall Rating — 2 HR
This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



1. **Concrete Blocks* —** Various designs. Classification D-2 (2 hr).
See **Concrete Blocks** category for list of eligible manufacturers.

2. **Mortar —** Blocks laid in full bed of mortar, nom. 3/8 in. thick, of not less than 2-1/4 and not more than 3-1/2 parts of clean sharp sand to 1 part Portland cement (proportioned by volume) and not more than 50 percent hydrated lime (by cement volume). Vertical joints staggered.

3. **Portland Cement Stucco or Gypsum Plaster —** Add 1/2 hr to classification if used. Where combustible members are framed in wall, plaster or stucco must be applied on the face opposite framing to achieve a max. Classification of 1-1/2 hr. Attached to concrete blocks (Item 1).

4. **Loose Masonry Fill —** If all core spaces are filled with loose dry expanded slag, expanded clay or shale (Rotary Kiln Process), water repellant vermiculite masonry fill insulation, or silicone treated perlite loose fill insulation add 2 hr to classification.

5. **Foamed Plastic* —** (Optional-Not Shown) — 1-1/2 in. thick max, 4 ft wide sheathing attached to concrete blocks (Item 1).
ATLAS ROOFING CORP — EnergyShield Pro Wall Insulation, EnergyShield Pro 2 Wall Insulation, EnergyShield CGF Pro, EnergyShield Ply Pro, EnergyShield® CGF, EnergyShield® PanelCast, EnergyShield® and "EnergyShield® XR

DUPONT DE NEMOURS, INC. — Types Thermax Sheathing, Thermax Light Duty Insulation, Thermax Heavy Duty Insulation, Thermax Metal Building Board, Thermax White Finish Insulation, Thermax ci Exterior Insulation, Thermax XARMOR ci Exterior Insulation, Thermax IH Insulation, Thermax Plus Liner Panel, Thermax Heavy Duty Plus (HDP), TUFF-R™ ci Insulation, Thermax Butler Stylwall Insulation Board and Thermax Morton Heavy Duty Insulation Board

FIRESTONE BUILDING PRODUCTS CO L L C — "Enverge™ CI Foil Exterior Wall Insulation" and "Enverge™ CI Glass Exterior Wall Insulation"

HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — Types "Xci-Class A", "Xci Foil (Class A)", "Xci 286"

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — Types "TSX-8500", "ECOMAXci FR", "TSX-8510", "ECOMAX xi FR White", "ECOMAXci", "ECOMAXci FR Air Barrier", "Thermasheath-XP", "Thermasheath", "Durasheath"

JOHNS MANVILLE — Type "AP Foil-Faced Foam Sheathing"

5A. **Building Units* —** As an alternate to Items 5, min. 1-in thick polyisocyanurate composite foamed plastic insulation boards, nom. 48 by 48 or 96 in.

ATLAS ROOFING CORP — EnergyShield® Ply

HUNTER PANELS, A DIVISION OF CARLISLE CONSTRUCTION MATERIALS, LLC — "Xci NB", "Xci Ply"

RMAX, A BUSINESS UNIT OF SIKA CORPORATION — "Thermasheath-SI", "ECOBASEci", "ThermaBase-CI", "ECOMAXci FR Ply", "ECOMAXci Ply".

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2023-04-14

UL DETAIL U905 | NTS | 4

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- Only products which bear UL's Mark are considered Certified.

XHEZ - Through-penetration Firestop Systems

See General Information for Through-penetration Firestop Systems

System No. W-J-1035

December 09, 2008

F Rating — 2 Hr

T Rating — 0 Hr

SECTION A-A

1. **Wall Assembly —** Min 5 in. thick reinforced lightweight or normal weight (100-150 pcf) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***, Max diam of opening is 9 in.
See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrants —** One metallic pipe or tubing to be installed either concentrically or eccentrically within the firestop system. Pipe or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes or tubing may be used:
A. **Steel Pipe —** Nom 4 in. diam (or smaller) Schedule 10 (or heavier) steel pipe.

B. **Iron Pipe —** Nom 4 in. diam (or smaller) cast or ductile iron pipe.

C. **Copper Tubing —** Nom 4 in. diam (or smaller) Type L (or heavier) copper tubing.

D. **Copper Pipe —** Nom 4 in. diam (or smaller) Regular (or heavier) copper pipe.

3. **Firestop System —** The firestop system shall consist of the following:
A. **Pipe and Equipment Covering Materials* —** Max 2 in. thick hollow cylindrical heavy density (min 3.5 pcf) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Pipe covering to be wrapped around the through penetrant and extend a min 2-1/2 in. beyond both surfaces of the wall. The annular space between pipe covering and the edge of the through opening shall be min 0 in. (continuous point contact) to max 1/2 in.
See **Pipe and Equipment Covering — Materials** (BRGU) category in the Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

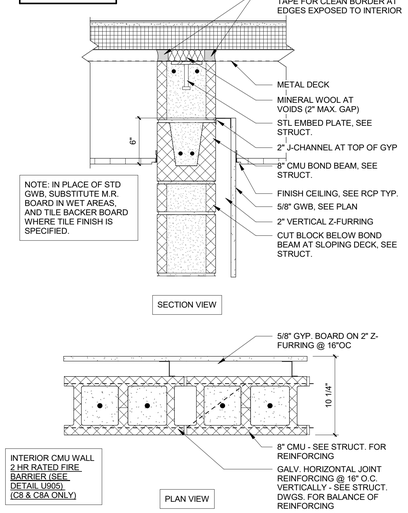
B. **Fill, Void or Cavity Material* — Sealant —** Min 5/8 in. thickness of fill material applied within annulus, flush with both surfaces of wall. A min 1/4 in. crown of fill material shall be applied to the pipe covering/concrete interface at the point contact location and lapping 1/4 in. beyond the periphery of the opening on both sides of the wall.
SPECIFIED TECHNOLOGIES INC — SpecSeal Series SSS Sealant or SpecSeal LCI Sealant

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2008-12-09

UL DETAIL W-J-1035 | NTS | 5

8" CMU



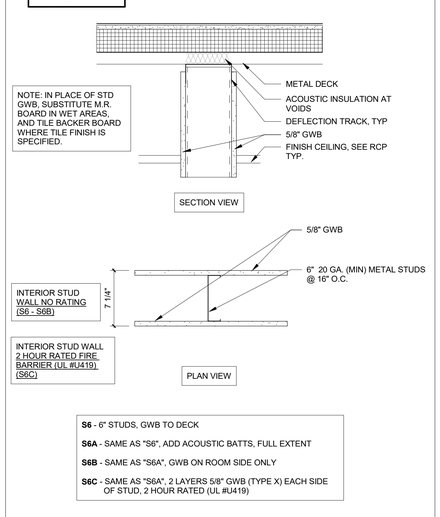
C8 - 8" CMU TO DECK (FILL VOID AT HEAD W/ MINERAL WOOL) 2HR. RATED (UL905)

C8A - SAME AS "C8" ADD 5/8" GYP ON 2" METAL Z-FURRING @ 16" OC ON ONE SIDE OF WALL.

C8B - 8" CMU TO HEIGHT SHOWN IN DRAWINGS (SEE STRUCTURAL FOR REINFORCING)

"C8" PARTITIONS | 1 1/2" = 1'-0" | 3

6" STUDS



S6 - 6" STUDS, GWB TO DECK

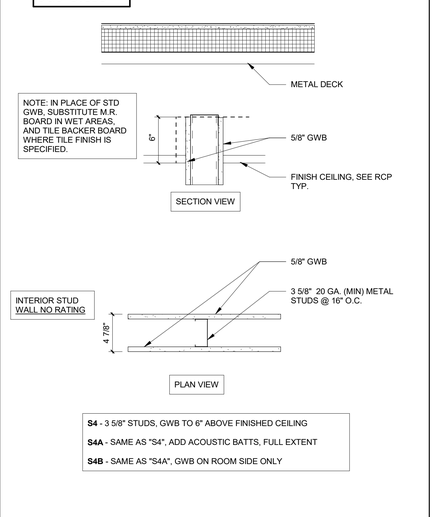
S6A - SAME AS "S6", ADD ACOUSTIC BATTS, FULL EXTENT

S6B - SAME AS "S6A", GWB ON ROOM SIDE ONLY

S6C - SAME AS "S6A", 2 LAYERS 5/8" GWB (TYPE X) EACH SIDE OF STUD, 2 HOUR RATED (UL #U419)

"S6" PARTITIONS | 1 1/2" = 1'-0" | 2

3 5/8" STUDS



S4 - 3 5/8" STUDS, GWB TO 6" ABOVE FINISHED CEILING

S4A - SAME AS "S4", ADD ACOUSTIC BATTS, FULL EXTENT

S4B - SAME AS "S4A", GWB ON ROOM SIDE ONLY

"S4" PARTITIONS | 1 1/2" = 1'-0" | 1

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RICHMOND COMMUNITY COLLEGE

SCO #22-25472-01A
NCCCS #2689

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HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 West Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

WALL TYPES & UL DETAILS

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

3-3-2025

SHEET NUMBER

A003

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UL Solutions

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BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

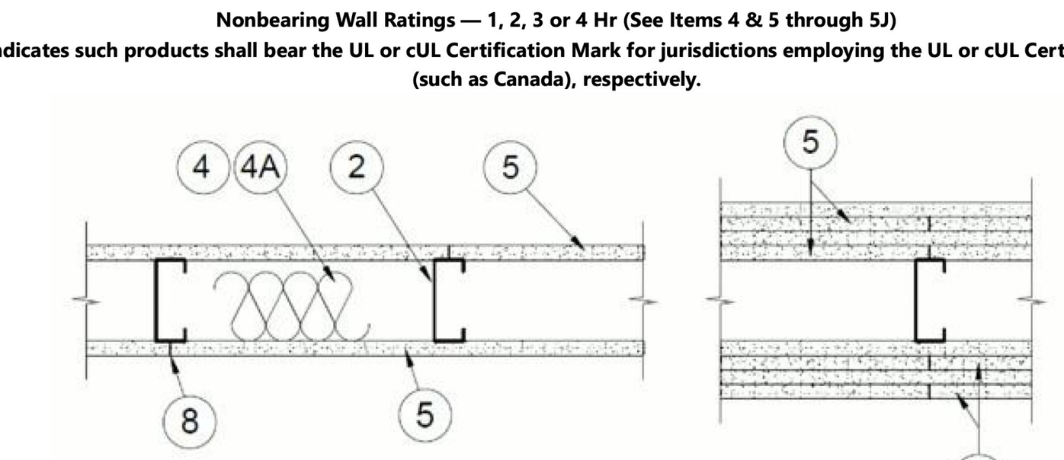
See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

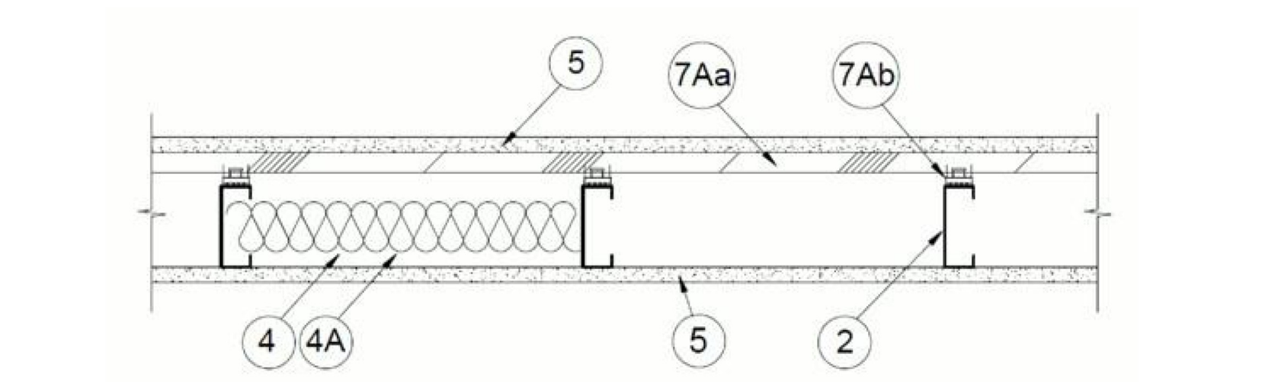
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

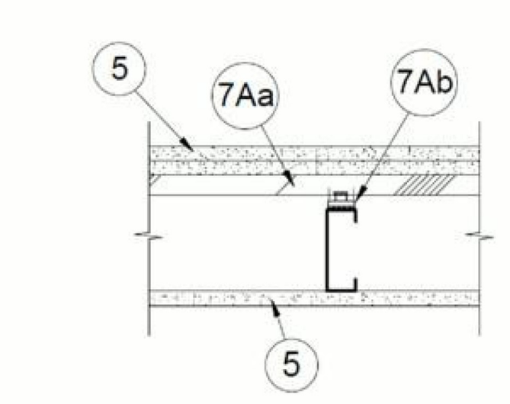
Design No. **U419**

March 15, 2024

Nonbearing Wall Ratings — 1, 2, 3 or 4 Hr (See Items 4 & 5 through 5J)
*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**







1. **Floor and Ceiling Runners —** (Not Shown) — For use with Item 2 — Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max.

1A. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2B, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.
CEMCO, LLC — Viper25™ Track

CRACO MFG INC — SmartTrack25™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™ Track

IMPERIAL MANUFACTURING GROUP INC — Viper25™ Track

1B. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2C, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
CEMCO, LLC — Viper20™ Track

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track

IMPERIAL MANUFACTURING GROUP INC — Viper20™ Track

1C. **Framing Members* — Floor and Ceiling Runners —** (Not Shown) — In lieu of Item 1 — Channel shaped, attached to floor and ceiling with fasteners 24 in. OC. max.
ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME D24/30EQD and Type SUPREME D20

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME D24/30EQD and Type SUPREME D20

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME D24/30EQD and Type SUPREME D20

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME D24/30EQD and Type SUPREME D20

TELLING INDUSTRIES L L C — Type SUPREME D24/30EQD and Type SUPREME D20

UNITED METAL PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

1D. **Floor and Ceiling Runners —** (Not Shown) — For use with Item 2A — Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, min depth to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners spaced max 24 in. OC.

1E. **Framing Members* — Floor and Ceiling Runners —** (Not Shown, As an alternate to Item 1) — For use with Items 2E, 5F or 5G or 5I only, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.
CLARKDIETRICH BUILDING SYSTEMS — CD ProTRAK

DMFCWBS L L C — ProTRAK

MBA METAL FRAMING — ProTRAK

RAM SALES L L C — Ram ProTRAK

STEEL STRUCTURAL PRODUCTS L L C — Tri-S ProTRAK

1F. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2F, proprietary channel shaped runners, minimum width to accommodate stud size, with 1- 1/8 in. long legs fabricated from min 0.015 in. (min bare metal thickness) galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
SUPER STUD BUILDING PRODUCTS — The Edge

1G. **Framing Members* — Floor and Ceiling Runner —** For use with Item 2G, proprietary channel shaped runners, minimum width to accommodate stud size attached to floor and ceiling with fasteners 24 in. OC max.
STUDCO BUILDING SYSTEMS — CROCSTUD Track

1H. **Floor and Ceiling Runners —** (Not Shown) — Channel shaped, fabricated from min 0.02 in. galv steel, min width to accommodate stud size, with min 1 in. long legs, for use with studs specified below and fabricated from min 0.018 in. galv steel or thicker, attached to floor and ceiling with fasteners spaced max 24 in. OC.
MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track VT100

IMPERIAL MANUFACTURING GROUP INC — Viper20™ Track VT100

1I. **Framing Members* — Floor and Ceiling Runners —** (Not Shown, As an alternate to Item 1) — For use with Items 2H, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.
TELLING INDUSTRIES L L C — TRUE-TRACK™

1J. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2I, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.

1K. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2J, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

1L. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2N, proprietary channel shaped runners, 1-1/4 in. wide by min. 3-1/2 in. deep fabricated from min 0.018 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
RESCUE METAL FRAMING, L L C — AlphaTRAK

1M. **Framing Members* — Floor and Ceiling Runners —** Not Shown — As an alternate to Item 1 — For use with Item 2O, proprietary channel shaped runners, min width to accommodate stud size, galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
RONDO BUILDING SERVICES PTY LTD — Rondo Wall Track

1N. **Framing Members* — Floor and Ceiling Runners —** Not Shown — As an alternate to Item 1 — For use with Item 2P, proprietary channel shaped runners, min width to accommodate stud size, galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.
OEG BUILDING MATERIALS — OEG Track

1O. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2Q, proprietary channel shaped runners, min width to accommodate stud size, fabricated from min. 25 MSG (0.018 in. min. bare metal thickness), attached to floor and ceiling with fasteners spaced 24 in. OC max.
CEMCO, LLC — Viper X Track

1P. **Framing Members* — Floor and Ceiling Runner —** (Not Shown — Alternate to Item 1) — For use with Item 2R, channel shaped runners pre-equipped with proprietary attachment clips. Min. 3-5/8 in. wide. Legs of top runners minimum 3-1/4 in. wide. Legs of bottom runners minimum 1-1/2 in. wide. Runners attached to floor and ceiling with fasteners 24 in. OC max.

HYPERFRAME INC - Hypertrack

1Q. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2S , proprietary channel shaped runners, min width to accommodate stud size, fabricated from min. 20 EQ/22 mils. (min. 0.0221 in. thick) galvanized steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

JJC INTERNATIONAL DISTRIBUTORS — Non-structural Tracks 3-5/8" and 6".

1R. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2T, proprietary channel shaped runners ,min width to accommodate stud size, fabricated from min. 25 MSG (0.018 in. min. bare metal thickness), attached to floor and ceiling with fasteners spaced 24 in. OC max

IRONLINE METALS LLC — Bantam Track.

2. **Steel Studs —** Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

2A. **Steel Studs —** (As an alternate to Item 2, For use with Items 5B, 5E, 5H, 5J or Type ULIX) — Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min depth, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

2B. **Framing Members* - Steel Studs —** (As an alternate to Item 2, For use with Items 5C, 5I or Type ULIX) — Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a 1/2 in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.

CEMCO, LLC — Viper25™

CRACO MFG INC — SmartStud25™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™

IMPERIAL MANUFACTURING GROUP INC — Viper25™

2C. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.
CEMCO, LLC — Viper20™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™

IMPERIAL MANUFACTURING GROUP INC — Viper20™

2D. **Framing Members* — Steel Studs —** In lieu of Item 2 — Channel shaped studs, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME D24/30EQD and Type SUPREME D20

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME D24/30EQD and Type SUPREME D20

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME D24/30EQD and Type SUPREME D20

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME D24/30EQD and Type SUPREME D20

TELLING INDUSTRIES L L C — Type SUPREME D24/30EQD and Type SUPREME D20

UNITED METAL PRODUCTS INC — Type SUPREME D24/30EQD and Type SUPREME D20

2E. **Framing Members* — Steel Studs —** (Not Shown, As an alternate to Item 2) — For use with Items 5F or 5G or 5I or Type ULIX only, channel shaped studs, min depth as indicated under Item 5F, 5G or 5I, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
CLARKDIETRICH BUILDING SYSTEMS — CD ProSTUD

DMFCWBS L L C — ProSTUD

MBA METAL FRAMING — ProSTUD

RAM SALES L L C — Ram ProSTUD

STEEL STRUCTURAL PRODUCTS L L C — Tri-S ProSTUD

2F. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, minimum width indicated under Item 5, 1-1/4 in. deep fabricated from min 0.015 in. (min bare metal thickness) galvanized steel. Studs 3/8 in. to 3/4 in. less in lengths than assembly heights.
SUPER STUD BUILDING PRODUCTS — The Edge

2G. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped studs, minimum width indicated under Item 5, Studs to be cut 3/8 to 3/4 in less than the assembly height.
STUDCO BUILDING SYSTEMS — CROCSTUD

2H. **Framing Members* — Steel Studs —** (Not Shown, As an alternate to Item 2) — Fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.
TELLING INDUSTRIES L L C — TRUE-STUD™

2I. **Framing Members* — Steel Studs —**

2J. **Framing Members* — Metal Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights

2K. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.
EB METAL INC — NITROSTUD

2L. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.
OLMAR SUPPLY INC — PRIMESTUD

2M. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.
MARINO/WARE, DIV OF WARE INDUSTRIES INC — StudRite™

2N. **Framing Members*— Steel Studs —** As an alternate to Item 2 — proprietary channel shaped steel studs, min depth 3-1/2 in. and as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min 0.018 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in length than assembly height.
RESCUE METAL FRAMING, L L C — AlphaSTUD

2O. **Framing Members* — Steel Studs —** As an alternate to Item 2 — proprietary channel shaped steel studs, min width as indicated under Item 5, galv steel. Studs to be cut 3/8 to 3/4 in. less in lengths than assembly height. Spaced 24 in. OC max.
RONDO BUILDING SERVICES PTY LTD — Rondo Lipped Wall Stud

2P. **Framing Members* — Steel Studs —** As an alternate to Item 2 — proprietary channel shaped steel studs, min width as indicated under Item 5, min 25 MSG galv steel. Studs to be cut 3/8 to 3/4 in. less in lengths than assembly height. Spaced 24 in. OC max.
OEG BUILDING MATERIALS — OEG Stud

2Q. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — For use with Item 1O, proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min 25 MSG (0.018 in. min. bare metal thickness). Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.
CEMCO, LLC — Viper X

2R. **Framing Members* — Steel Studs —** (Not Shown — Alternate to Item 2, For use with Item 1P) — Channel shaped steel studs with attachment clips at top and bottom, min 3-5/8 in. depth, spaced a max of 24 in. OC. Studs clipped into floor and ceiling runners (Item 1P). Max 2-3/8 in. extension reveal from top of stud to inside of ceiling runner.

HYPERFRAME INC— Hyperstud

2S. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — For use with Item 1Q, proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min. 20 EQ/22 mils. (min. 0.0221 in. thick) galvanized steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

JJC INTERNATIONAL DISTRIBUTORS — Non-structural Studs 3-5/8" and 6".

2T. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — For use with Item 1R, proprietary channel shaped steelstuds, min depth as indicated under Item 5, spaced a max of 24 in. OC, fabricated from min 25 MSG (0.018 in. min. bare metal thickness). Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

IRONLINE METALS LLC — Bantam Stud.

3. **Wood Structural Panel Sheathing —** (Optional, For use with Item 5 Only) — (Not Shown) — 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108, manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min. head diam. of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, gypsum panels attached over OSB or plywood panels and fastener lengths for gypsum panels increased by min. 1/2 in.

4. **Batts and Blankets* —** (Required as indicated under Item 5) — Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 5.
See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

4A. **Batts and Blankets* —** (Optional – as an alternate to item 4) — Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance.
See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

4B. **Fiber, Sprayed* —** (Optional – as an alternate for items 4 or 4A, for use with Type ULIX) Where insulation is required - Spray applied granulated mineral fiber material. The fiber is applied with adhesive at a minimum density of 4.0 pcf to completely fill the wall cavity in accordance with the application instructions supplied with the product. See **Fiber, Sprayed** (CCAZ).
AMERICAN ROCKWOOL MANUFACTURING, LLC — Type Rockwool Premium Plus

4C. **Foamed Plastic* —** (As an alternate for items 4, 4A or 4B, for use with Item 5K) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity, for 2 hour rated assemblies only. When foamed plastic is used, minimum stud depth shall be 3-1/2 in. with minimum 20 MSG steel thickness.

CARLISLE SPRAY FOAM INSULATION — Types SealTite ONE, SealTite Pro Closed Cell (CC), SealTite Pro Open Cell (OC), SealTite Pro OCX, SealTite Pro No Trim 21, SealTite Pro One Zero, Foamsulate Closed Cell, Foamsulate OCX, Foamsulate 70, and Foamsulate HFO.

4D. **Foamed Plastic* —** (As an alternate for items 4, 4A or 4B, for use with Item 5K) — Spray applied, foamed plastic insulation, at any thickness from partial fill to completely filling stud cavity, for up to 2 hour rated assemblies only. When foamed plastic is used, minimum stud depth shall be 3-1/2 in. with minimum 20 MSG steel thickness.

BASF CORP - Enertite® NM, Enertite® G, FE178®, Spraytite® 178, Spraytite® 81206, Walltite® 200, Walltite® US, Walltite® US-N, Walltite HP+, FE137®, FE158®, Spraytite® 158, Spraytite® SP, Spraytite® 81205, Spraytite® Comfort XL, Walltite® XL, and Walltite® MAX

5. **Gypsum Board* —** Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite

sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) with Type ULIX need not be staggered. The thickness and number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Items 2, 2C, 2D, 2F, 2G, 2O	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4)
1	3-1/2	1 layer, 5/8 in. thick	Optional
1	2-1/2	1 layer, 1/2 in. thick	1-1/2 in.
1	1-5/8	1 layer, 3/4 in. thick	Optional
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
2	3-1/2	1 layer, 3/4 in. thick	3 in.
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	2 layers, 3/4 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional
4	2-1/2	2 layers, 3/4 in. thick	2 in.

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR; WRC, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX, WRX or WRC; 3/4 in. thick Types IP-X3 or ULTRACODE

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — 1/2 in. thick Type C and 5/8 in. thick Type SCX

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type SCX, SGX, SHX, ULIX, WRX, IP-X1, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX, SGX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX, WRC or; 3/4 in. thick Types IP-X3 or ULTRACODE

When Item 7B, **Steel Framing Members***, is used, Nonbearing Wall Rating is limited to 1 Hr. Min. stud depth is 3-1/2 in., min. thickness of insulation (Item 4) is 3 in., and two layers of gypsum board panels (1/2 in. or 5/8 in. thick) shall be attached to furring channels as described in Item 6. One layer of gypsum board panels (1/2 in. or 5/8 in. thick) attached to opposite side of stud without furring channels as described in Item 6.

5A. **Gypsum Board* —** (As an alternate to Item 5) — 5/8 in. thick, 24 to 54 in. wide, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 6.
CGC INC — Type SHX.

UNITED STATES GYPSUM CO — Type FRX-G, SHX.

USG MEXICO S A DE C V — Type SHX.

5B. **Gypsum Board* —** (Not Shown) — As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 in or 3/4 in. thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) — Nom 5/8 in. or

3/4 in. may be used as alternate to all 5/8 in. or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 in. or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to 20 MSG steel studs Item 2A with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 11) or Lead Discs or Tabs (see Item 12).
RAY-BAR ENGINEERING CORP — Type RB-LBG

5C. **Gypsum Board* —** (For Use With Item 2B) — Rating Limited to 1 Hour. 5/8 in. thick, 48 in. wide, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. (Vertical Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. Vertical joints are to be centered over studs and staggered one stud cavity on opposite sides of studs. (Horizontal Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. All horizontal joints are to be backed as outlined under section VI of Volume 1 in the Fire Resistive Directory.
CGC INC — Type SCX, ULIX.

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Type SCX

UNITED STATES GYPSUM CO — Type SCX, SGX, ULIX.

USG BORAL DRYWALL SFZ LLC — Type SCX

USG MEXICO S A DE C V — Type SCX

5D. **Gypsum Board* —** (As an alternate to Item 5) — 5/8 in. thick, 48 in. wide, applied vertically or horizontally. Secured as described in Item 6. For use with Items 1 and 2 only.
CGC INC — Type USGX

UNITED STATES GYPSUM CO — Type USGX

USG BORAL DRYWALL SFZ LLC — Type USGX

USG MEXICO S A DE C V — Type USGX

5E. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nominal 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 (or No. 6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.
NEW ENGLAND LEAD BURNING CO INC, DBA NELCO — Nelco

5F. **Gypsum Board* —** (As an alternate to Item 5) — For use with Items 1E and 2E and limited to 1 Hour Rating only, Gypsum panels with beveled, square or tapered edges, applied vertically, and fastened to the steel studs with 1 in. long Type S screws spaced 8 in. OC along vertical and bottom edges and 12 in. OC in the field. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Steel stud depth shall be a minimum 3-5/8 in.
THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — Type SCX

UNITED STATES GYPSUM CO — 5/8 in. thick Type SCX, SGX, ULIX

USG BORAL DRYWALL SFZ LLC — 5/8 in. thick Type SCX, SGX

5G. **Gypsum Board* —** (As an alternate to Item 5) — For use with Items 1E and 2E only, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally, as specified in the table below and fastened to the steel studs as described in Item 6. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Item 2E	No. of Layers & Thickness of Panel	Min Thkns of Insulation (Item 4)
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR;, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, ULIX or 3/4 in. thick Types IP-X3 or ULTRACODE

THE SIAM GYPSUM INDUSTRY (SONGKHLA) CO — 1/2 in. thick Types C and 5/8 in. thick SCX

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type SCX, SGX, SHX, IP-X1, AR, C, , FRX-G, IP-AR, IP-X2, IPC-AR, ULIX; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL DRYWALL SFZ LLC — 1/2 in. Type C; 5/8 in. Types C, SCX, SGX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in. thick Types IP-X3 or ULTRACODE

5H. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 or 3/4 in thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) - Nom 5/8 or 3/4 in. may be used as alternate to all 5/8 or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Gypsum board secured to 20 MSG steel studs Item 2B with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 11A) or Lead Discs (see Item 12A).
MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

5I. **Gypsum Board* —** (As an alternate to Item 5) — Nom. 5/8 in. thick gypsum panels with beveled, square or tapered edges installed as described in Item 5. Steel stud minimum depth shall be as indicated in Item 5.
CGC INC — Type ULIX, ULX

UNITED STATES GYPSUM CO — Type ULIX, ULX

USG MEXICO S A DE C V — Type ULX

5J. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".
RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

5K. **Gypsum Board* —** (As an alternate to Item 5 when Foam Plastic insulation (Items 4C or 4D) is used) **—** Any 5/8 in. thick, 4 ft. wide, Gypsum Board listed in Item 5 above. Applied vertically with vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Gypsum panels secured to studs with 1-1/4 in. long Type S steel screws spaced 8 in. OC at perimeter and in the field. For 2 layer assemblies outer layer will be attached to studs over inner layer with the 1-7/8 in. long steel screws spaced 8 in. OC.

6. **Fasteners —** (Not Shown) — For use with Items 2 and 2F - Type S or S-12 steel screws used to attach panels to studs (Item 2) or furring channels (Item 7). **Single layer systems:** 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. **Single layer system with Type ULIX:** 1 in. long, spaced 12 in. OC in the field and perimeter, when panels are applied horizontally or vertically.**Two layer systems:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer.**Three-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. **Four-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

7. **Furring Channels —** (Optional, Not Shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. Not for use with Item 5A.

7A. **Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to studs with No. 8 x 9/16 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels.
PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75).

7B. **Framing Members* —** (Optional, Not Shown) — As an alternate to Item 7, for single or double layer systems, furring channels and Steel Framing Members on only one side of studs as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring

channels as described in Item 5. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ba) to one side of studs (Item 2) only. Clips spaced 48 in. OC., and secured to studs with two No. 8 x 2-1/2 in. coarse drywall screws, one through the hole at each end of the clip. Furring channels are friction fitted into clips.
KINETICS NOISE CONTROL INC — Type Isomax

7C. **Framing Members* —** (Not Shown) — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ca) to studs (Item 2). Clips spaced max. 48 in. OC. GENIECLIPS secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.
PLITEQ INC — Type GENIECLIP

7D. **Steel Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire.. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Da) to studs. Clips spaced 48 in. OC., and secured to studs with 2 in. coarse drywall screw with 1 in. diam washer through the center hole. Furring channels are friction fitted into clips
STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237 or A237R

7E. **Steel Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — Furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item 7Eb. Ends of adjoining channels overlapped 6 in. and tied together with double strand of No. 18 AWG galvanized steel wire.. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ea) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.
REGUPOL AMERICA — Type SonusClip

7F. **Steel Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — Resilient channels and Steel Framing Members as described below:
a. **Resilient Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC, and perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured in place with two No. 8 15 x 1/2 in. Philips Modified Truss screws spaced 2-1/2 in. from the center of the overlap. Gypsum board attached to resilient channels as described in Item 5. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach resilient channels (Item 7Fa) to studs. Clips spaced 48 in. OC., and secured to studs with No. 8 x 2-1/2 in. coarse drywall screw through the center hole. Resilient channels are secured to clips with one No. 10 x 1/2 in. pan-head self-drilling screw.
KEENE BUILDING PRODUCTS CO INC — Type RC+ Assurance Clip

7G. **Framing Members* —** (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:
a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ga) to studs (Item 2). Clips spaced max. 48 in. OC. Clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips.
CLARKDIETRICH BUILDING SYSTEMS — Type ClarkDietrich Sound Clip

8. **Joint Tape and Compound —** Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and joint compound may be omitted when gypsum panels are supplied with a square edge.

9. **Siding, Brick or Stucco —** (Optional, Not Shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

10. **Caulking and Sealants* —** (Optional, Not Shown) — A bead of acoustical sealant applied around the partition perimeter for sound control.
UNITED STATES GYPSUM CO — Type AS

11. **Lead Batten Strips —** (Not Shown, For Use With Item 5B) — Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5B) and optional at remaining stud locations. Required behind vertical joints.

11A. **Lead Batten Strips —** (Not Shown, For Use With Item 5H) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.

12. **Lead Discs or Tabs —** (Not Shown, For Use With Item 5B) — Used in lieu of or in addition to the lead batten strips (Item 11) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 5B) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

12A. **Lead Discs —** (Not Shown, for use with Item 5H) — Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.5% meeting the Federal Specification QQ-L-201f, Grades "B, C or D".

13. **Lead Batten Strips —** (Not Shown, For Use With Item 5E) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5E) and optional at remaining stud locations.

14. **Lead Tabs —** (Not Shown, For Use With Item 5E) — 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 5E) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.

15. **Barrier Mesh —** (Optional, Not Shown) - Attached to steel studs on one or both sides of the wall using Barrier Mesh Clips spaced at maximum 12 inches on center vertically, using a flat head type screw penetrating through the steel at least 3/8 of an inch. For Steel Studs less than 0.033 inches in thickness, use self-piercing screws. For Steel Studs equal to or greater than 0.033 inches in thickness, use steel drill screws (self-tapping). Gypsum Board (Item 5) to be installed directly over the Barrier Mesh using prescribed screw patterns with lengths increased by a minimum 1/8 in. Barrier Mesh may be installed with the long dimension of the diamond pattern positioned vertically or horizontally. Barrier Mesh joints may occur as butt joints at the framing members and secured using the Barrier Mesh Clips or occur in between framing members as overlapping joints secured using 18 SWG wire ties spaced a maximum 12 in. on center.
CLARKDIETRICH BUILDING SYSTEMS — Barrier Mesh, Barrier Mesh Clips

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2024-03-15

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BID DOCUMENTS

UL DETAILS

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

3-3-2025

SHEET NUMBER
A004

UL DETAIL - U419 12" = 1'-0" 1

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes		
Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

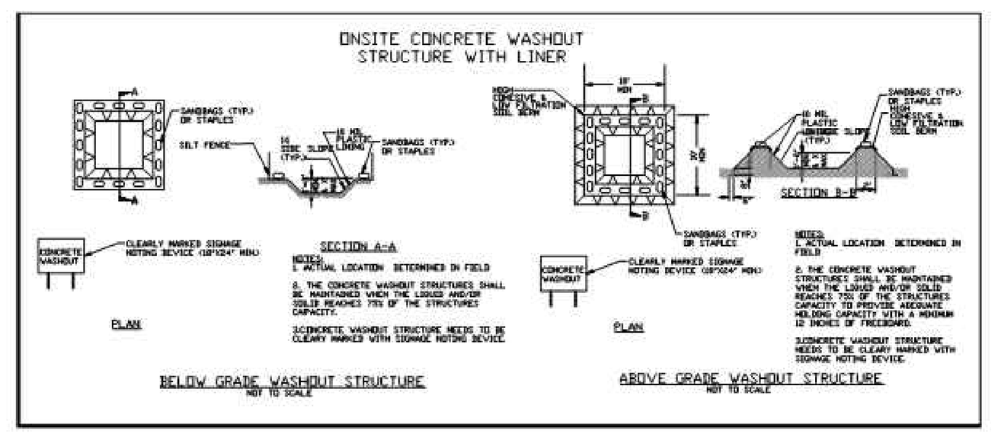
PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

NORTH CAROLINA Environmental Quality



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING

EFFECTIVE: 04/01/19

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual-day rainfall information is available, record the cumulative rain measurement for those un-attended days (and this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDCs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases.
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures or if the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible.*** The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days,*** a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

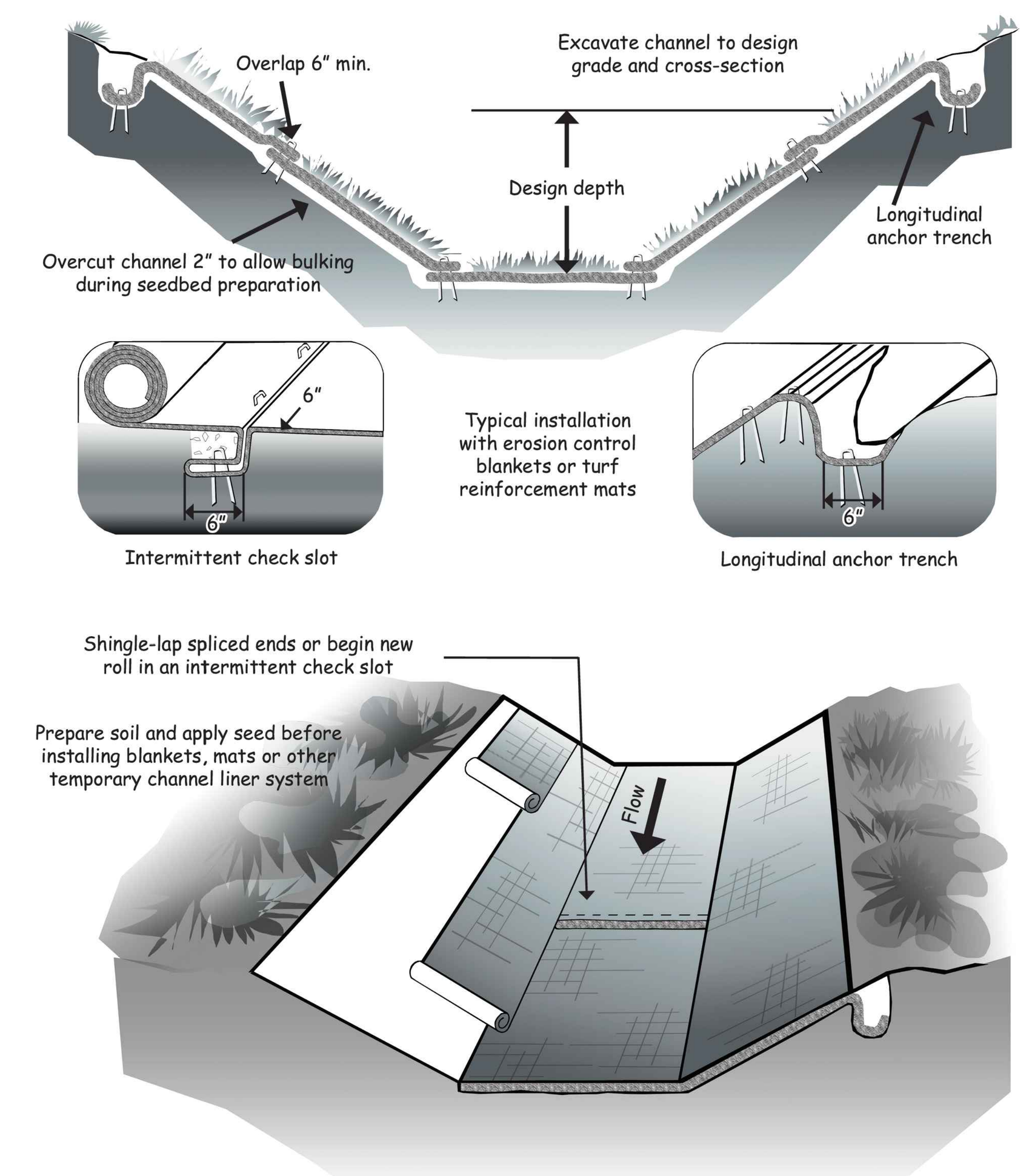
Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NORTH CAROLINA Environmental Quality

6

Figure 6.17d Temporary Channel Liners; Washington State Department of Ecology



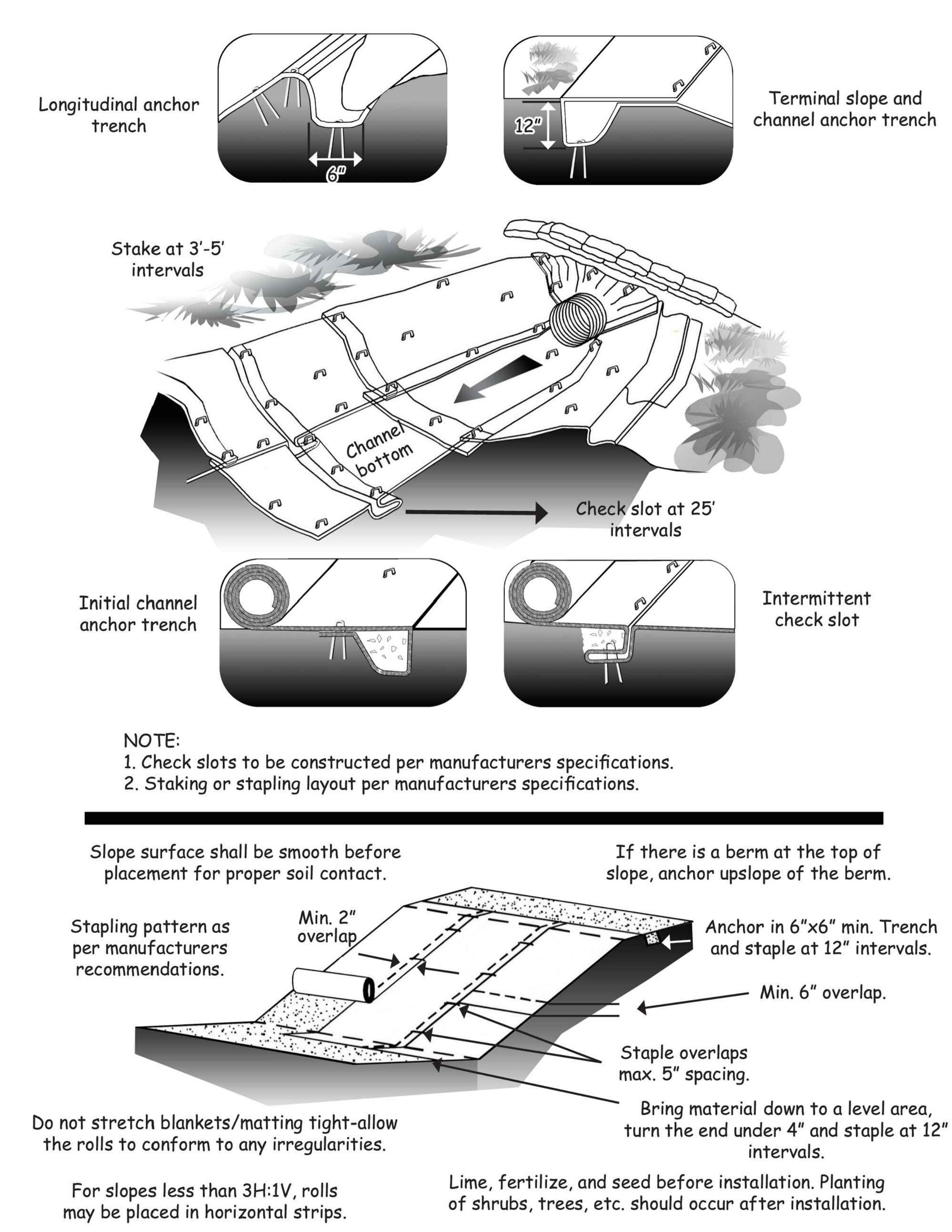
NOTES:
1. Design velocities exceeding 2 ft/sec require temporary blankets, mats or similar liners to protect seed and soil until vegetation becomes established.
2. Grass-lined channels with design velocities exceeding 6 ft/sec should include turf reinforcement mats

6.17.10 Rev. 6/06

CHANNEL AND SLOPE STABILIZATION

Practice Standards and Specifications

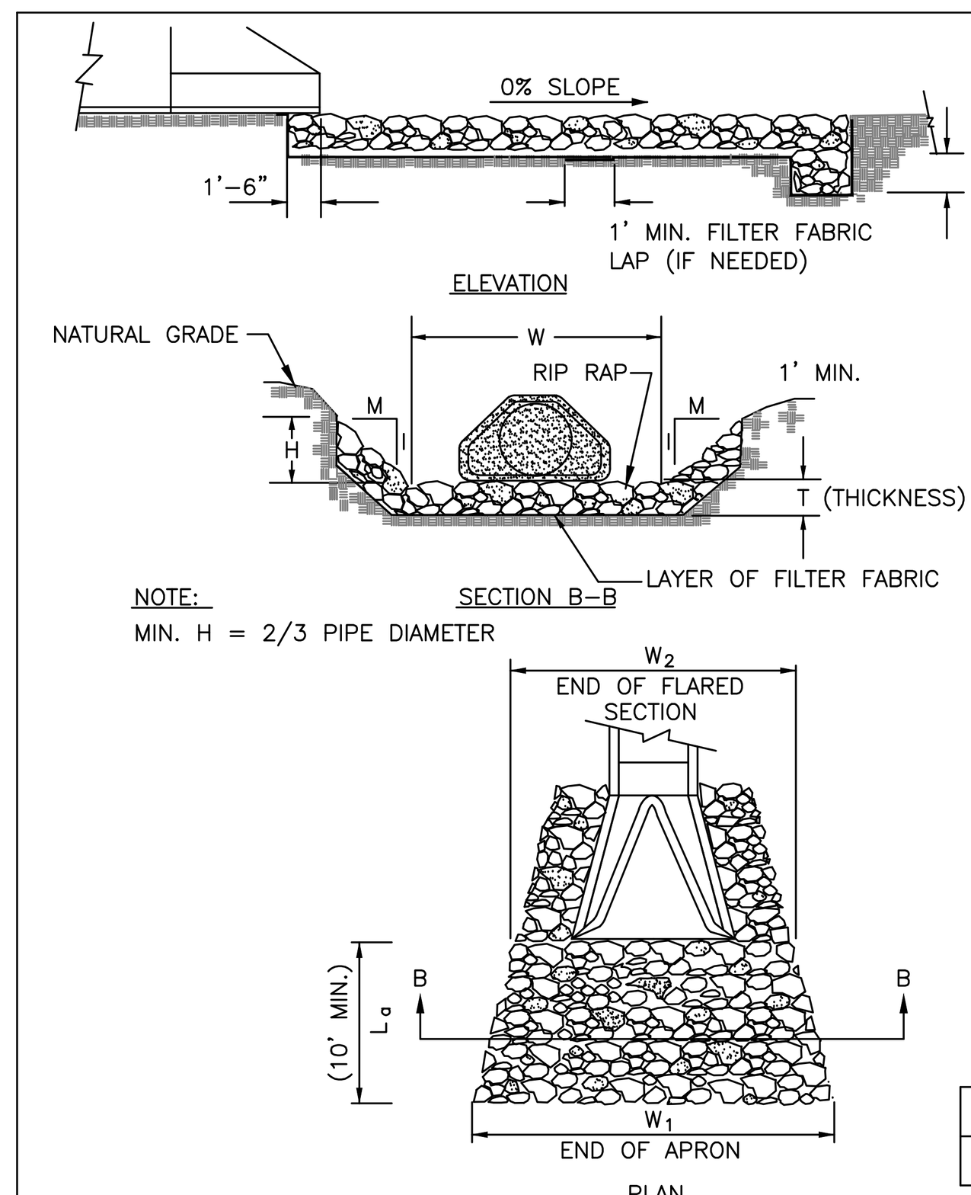
Figure 6.17e Channel Installation and Slope Installation; Washington State Ecology Department



NOTE:
1. Check slots to be constructed per manufacturers specifications.
2. Staking or stapling layout per manufacturers specifications.

Rev. 6/06 6.17.11

CHANNEL AND SLOPE STABILIZATION



NOTES:
1. CLASS OR MEDIAN SIZE OF RIPRAP AND LENGTH, WIDTH AND DEPTH OF APRON TO BE DESIGNED BY THE ENGINEER.
2. REFER TO THE NCDENR EROSION CONTROL DESIGN MANUAL FOR RIPRAP APRON DESIGN STANDARDS.
3. RIPRAP SHOULD EXTEND UP BOTH SIDES OF THE APRON AND AROUND THE END OF THE PIPE OR CULVERT AT THE DISCHARGE OUTLET AT A MAXIMUM SLOPE OF 2:1 AND A HEIGHT NOT LESS THAN TWO THIRDS THE PIPE DIAMETER OR CULVERT HEIGHT.
4. THERE SHALL BE NO OVERFLOW FROM THE END OF THE APRON TO THE SURFACE OF THE RECEIVING CHANNEL. THE AREA TO BE PAVED OR RIPRAPPED SHALL BE UNDERCUT SO THAT THE INVERT OF THE APRON SHALL BE AT THE SAME GRADE (FLUSH) WITH THE SURFACE OF THE RECEIVING CHANNEL. THE APRON SHALL HAVE A CUTOFF OR TOE WALL AT THE DOWNSTREAM END.
5. THE WIDTH OF THE END OF THE APRON SHALL BE EQUAL TO THE BOTTOM WIDTH OF THE RECEIVING CHANNEL. MAXIMUM TAPER TO RECEIVING CHANNEL 5:1
6. ALL SUBGRADE FOR STRUCTURE TO BE COMPACTED TO 95% OR GREATER.
7. THE PLACING OF FILL, EITHER LOOSE OR COMPACTED IN THE RECEIVING CHANNEL SHALL NOT BE ALLOWED.
8. NO BENDS OR CURVES IN THE HORIZONTAL ALIGNMENT OF THE APRON WILL BE PERMITTED.
9. FILTER FABRIC SHALL BE INSTALLED ON COMPACTED SUBGRADE PRIOR TO PLACEMENT OF RIP RAP.
10. ANY DISTURBED AREA FROM END OF APRON TO RECIEVING CHANNEL MUST BE STABILIZED.

USE USDA NOMOGRAPH FROM NC SEDIMENT AND EROSION CONTROL MANUAL OR NCDENR EROSION CONTROL DESIGN MANUAL FOR DESIGN DATA.

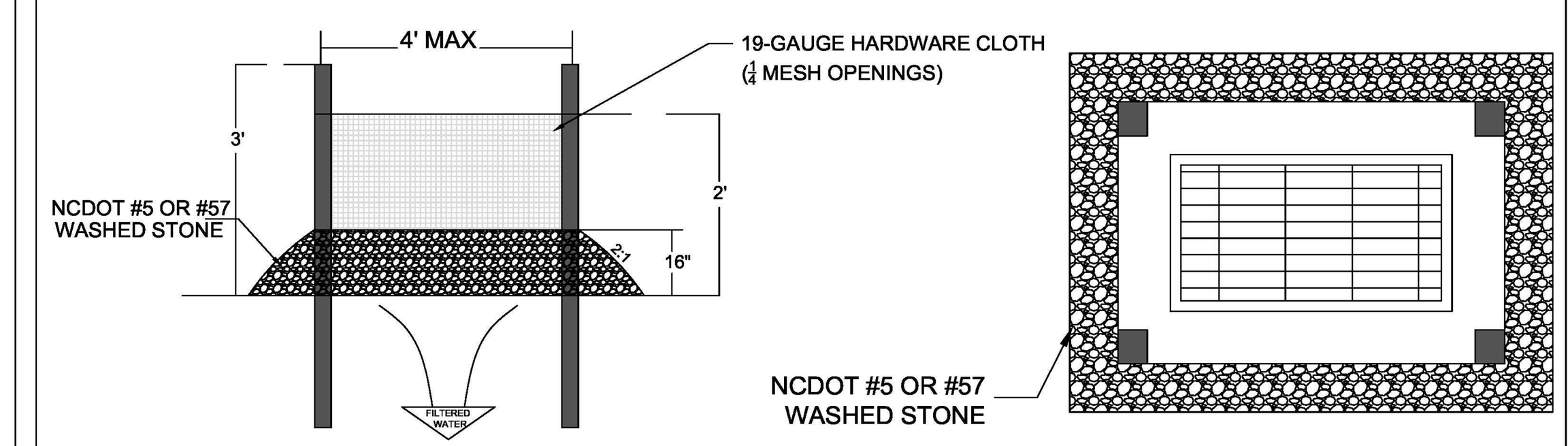
d_{50} (See Figure 8.06 a&b "NC SEDIMENT AND EROSION CONTROL MANUAL")
$d_{max} = 1.5 \times d_{50}$
$T = 1.5 \times d_{max}$

MAINTENANCE
RIP RAP SHOULD BE INSPECTED PERIODICALLY FOR SCOUR OR DISLODGED STONES. CONTROL OF WEED AND BRUSH GROWTH MAY BE NEEDED IN SOME LOCATIONS.

OUTLET	L_a	W_1	W_2	*T	H
A1	10	12	6	1.125	16

RIPRAP APRON AT PIPE OUTFALLS NTS

Date: Page:



Construction:
1. Uniformly grade a shallow depression approaching the inlet.
2. Drive 5-foot steel posts 2 feet into the ground surrounding the inlet. Space posts evenly around the perimeter of the inlet, a maximum of 4 feet apart.
3. Surround the posts with wire mesh hardware cloth. Secure the wire mesh to the steel posts at the top, middle, and bottom. Placing a 2-foot flap of the wire mesh under the gravel for anchoring is recommended.
4. Place clean gravel (NC DOT #5 or #57 stone) on a 2:1 slope with a height of 16 inches around the wire, and smooth to an even grade.
5. Once the contributing drainage area has been stabilized, remove accumulated sediment, and establish final grading elevations.
6. Compact the area properly and stabilize with groundcover.

Maintenance:
1. Inspect sediment fences at least once a week and after each 1 inch or greater rainfall. Make any required repairs immediately.
2. Clear the mesh wire of any debris or other objects to provide adequate flow for subsequent rains. Take care not to damage or undercut the mesh during sediment removal.
3. Replace stone as needed.

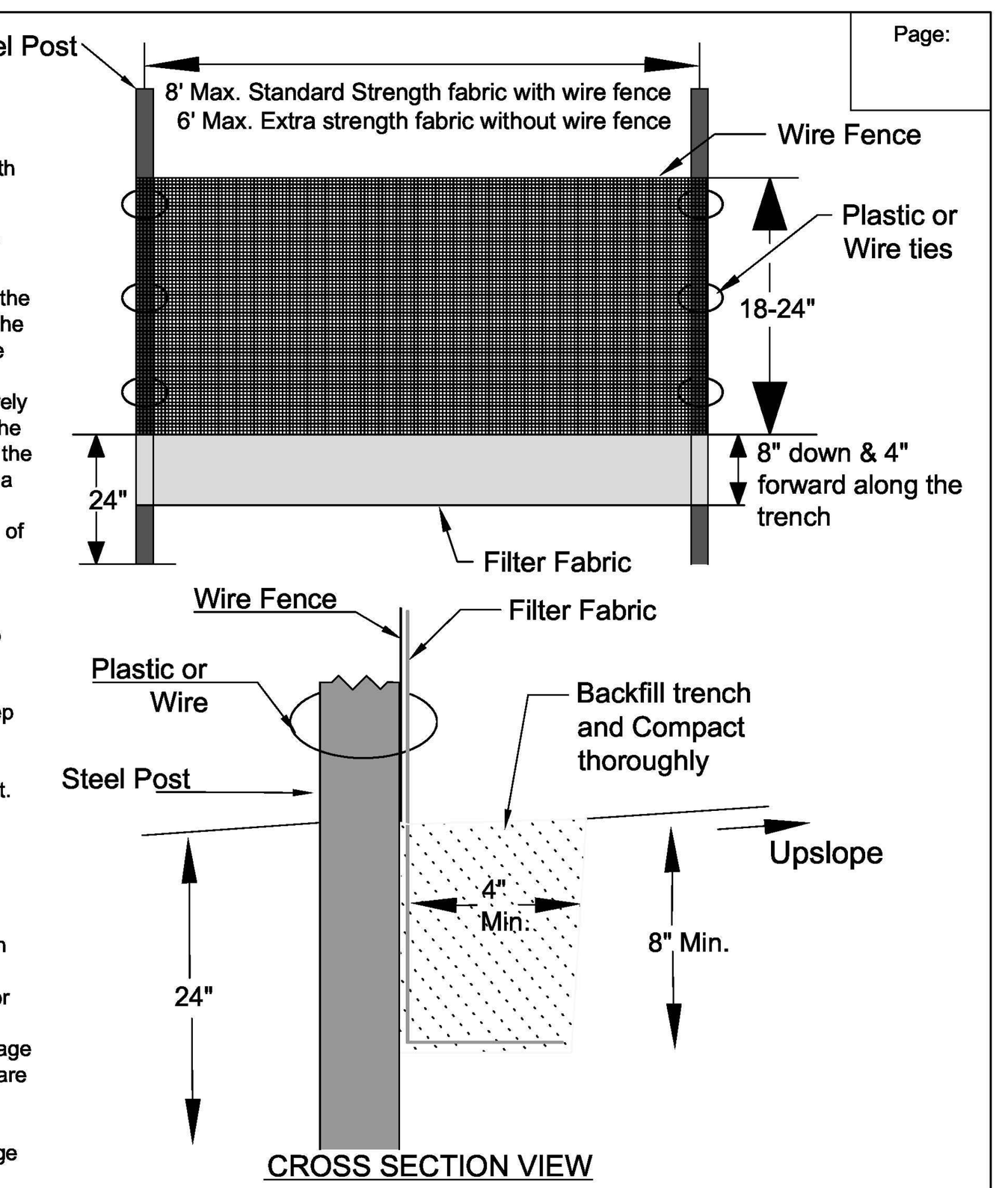
NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

INLET PROTECTION

Date: Page:

Construction:
1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.
2. Ensure that the height of the sediment fence does not exceed 24 inches above the ground. (Higher fences may impound volumes of water sufficient to cause failure of the structure.)
3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with 4 feet minimum overlap to the next post.
4. Support standard strength filter fabric by wire mesh fastened securely to the upslope side of the posts. Extend the wire mesh support to the bottom of the trench. Fasten the wire reinforcement, then fabric on the upslope side of the fence post. Wire or plastic zip ties should have a minimum 50 pound tensile strength.
5. When a wire mesh support fence is used, space posts a maximum of 8 feet apart. Supports should be driven securely into the ground a minimum of 24 inches.
6. Extra strength filter fabric with 6 feet post spacing does not require wire mesh support fence. Securely fasten the filter fabric directly to posts. Wire or plastic zip ties should have a minimum of 50 pound tensile strength.
7. Excavate the trench approximately 4 inches wide and 8 inches deep along the proposed line of the posts and upslope from the barrier.
8. Place 12 inches of fabric along the bottom and side of the trench.
9. Backfill the trench with soil placed over the filter fabric and compact. Thorough compaction of the backfill is critical to silt fence performance.
10. Do not attach filter fabric to existing trees.

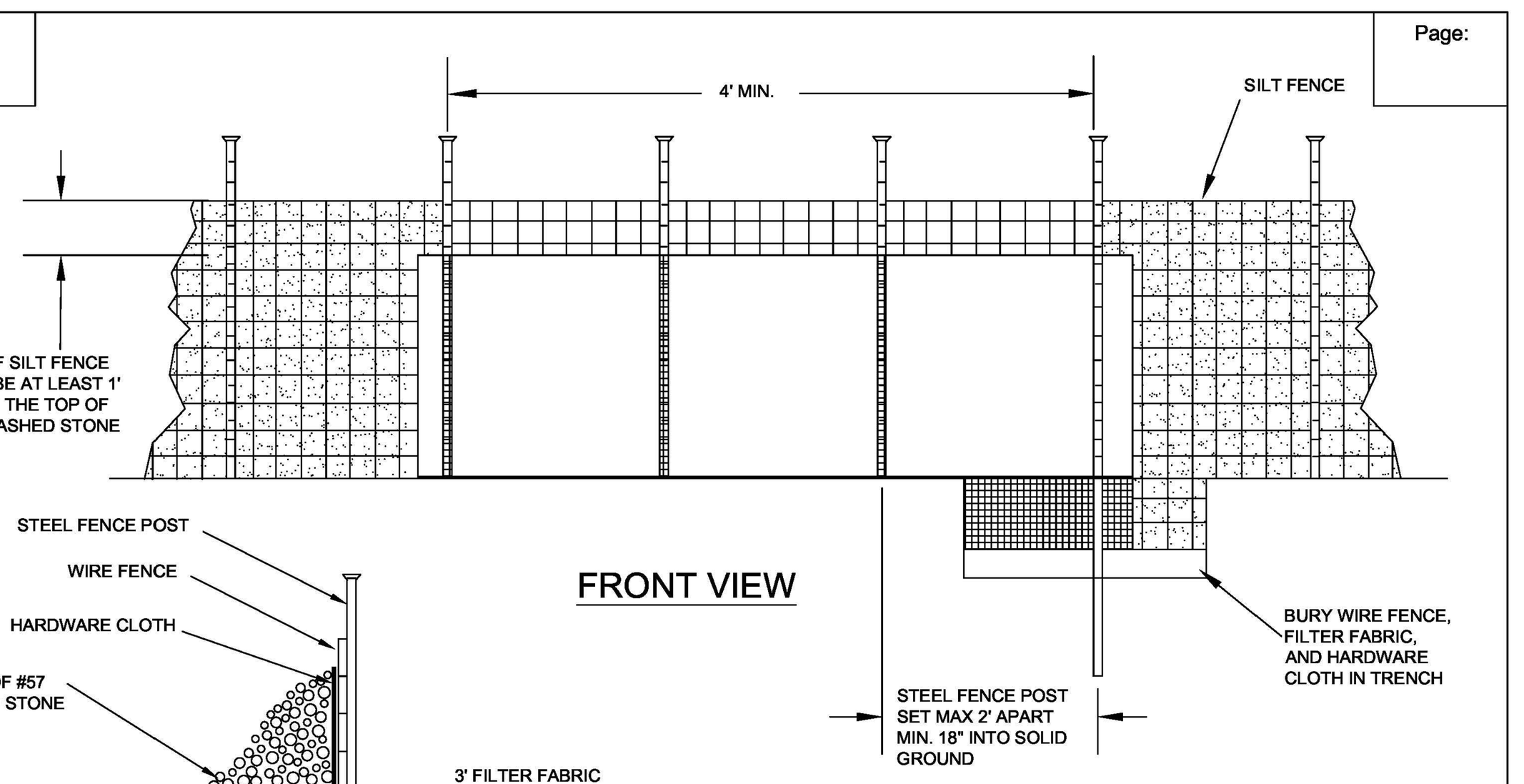
Maintenance:
1. Inspect sediment fences at least once a week and after each 1 inch rainfall. Make any required repairs immediately.
2. Should the fabric of a sediment fence collapse, tear, decompose, or become ineffective, replace it promptly.
3. Remove sediment deposits as necessary to provide adequate storage volume for the next rain and reduce pressure on the fence. Take care to avoid undermining the fence during cleanout.
4. Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

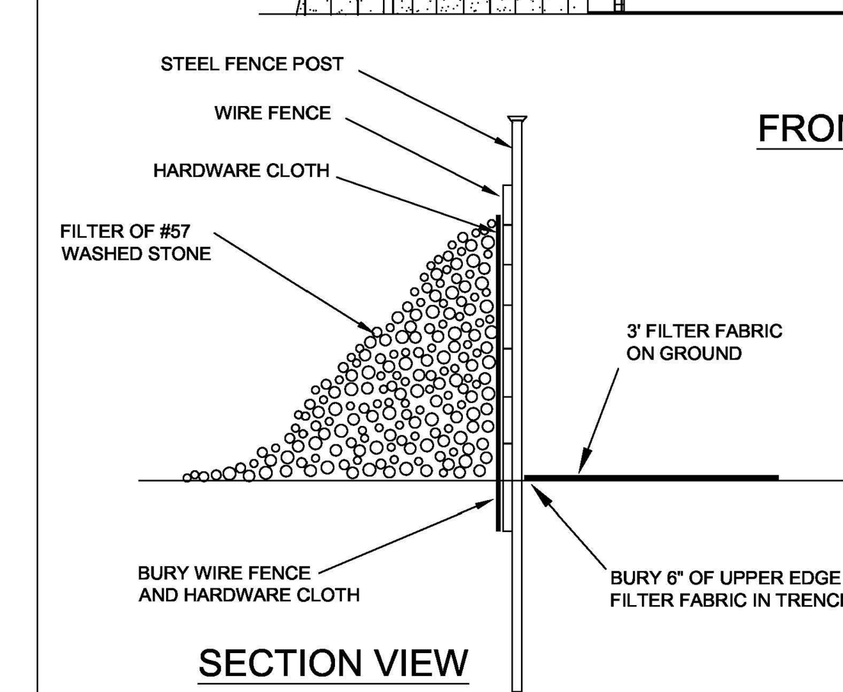


NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

SILT FENCE

Date: Page:





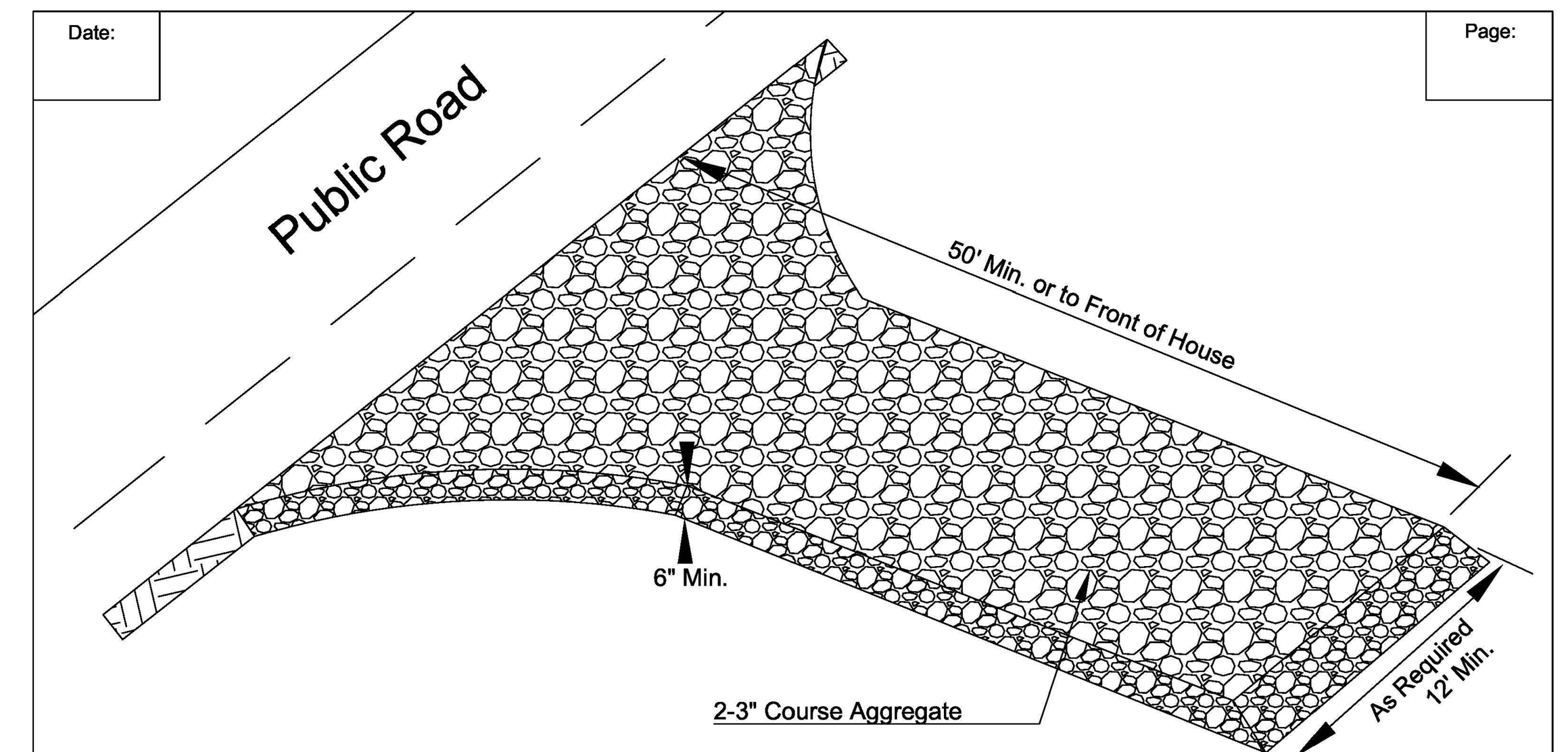
NOTES:
1. Hardware cloth and gravel should overlay the silt fence at least 12 inches.
2. Stone outlets should be placed on low elevation areas of silt fence and based on field conditions.

MAINTENANCE:
1. Per NCG-01, inspect outlet at lest once a week and after each 1 inch or greater rainfall event. Complete any required repairs immediately. Freshen stone when sediment accumulation exceeds 6 inches. Keep mesh free of debris to provide adequate flow.
2. Remove sediment when half of stone outlet is covered.
3. Replace stone as needed to facilitate de-watering.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

SILT FENCE OUTLET

Date: Page:



Construction:
1. Clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade it.
2. Place the gravel to the specific grade and dimensions shown on the plans, and smooth it.
3. Provide drainage to carry water to a sediment trap or other suitable outlet.
4. Use geotextile fabrics in order to improve stability of the foundation in locations subject to seepage or high water table.

Maintenance:
1. Per NCG-01 inspect at least once a week and after each 1 inch or greater rainfall; make any required repairs immediately.
2. Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2 inch stone.
3. Immediately remove all objectionable materials spilled, washed or tracked onto public roadways.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

CONSTRUCTION ENTRANCE / EXIT

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SCO #22-25472-01A
NCCCS #2689

RCC HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 West Hamlet Ave, Hamlet, NC 28345

SEAL 34280 BRIAN V. CRUTCHFIELD

BID DOCUMENTS

EROSION CONTROL NOTES & DETAILS

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
C501

C - SERIES DRAWING ABBREVIATIONS:

ADV - ADVANCE
AFG - ABOVE FINISHED GRADE
APPR LOC. - APPROXIMATE LOCATION
ASS'Y - ASSEMBLY
B/C - BACK OF CURB.
B/L - BASE LINE
B/W - BOTTOM OF WALL
CBR - CALIFORNIA BEARING RATIO
CG - CURB AND GUTTER
C/L - CENTERLINE
CL - CLASS
CMP - CORRUGATED METAL PIPE
CO - CLEAN OUT
CONC - CONCRETE
CONN - CONNECTION
CP - CORRUGATED PLASTIC
CY - CUBIC YARD
DI - DROP INLET
DIP - DUCTILE IRON PIPE
DR - DRIVE
DS - DOWNSPOUT
E - ELECTRIC
EA - EACH
E BOX - ELECTRICAL BOX
ELEC - ELECTRIC
E/P - EDGE OF PAVEMENT
E/S - EDGE OF SHOULDER
EX - EXISTING
F/C - FACE OF CURB
FDC - FIRE DEPARTMENT CONNECTION
FF - FINISHED FLOOR
FH - FIRE HYDRANT
F/L - FLOW LINE
FL - FIRE LANE
G - GAS
GND - GROUND
GTS - GAS TEST STATION
GV - GAS VALVE
HDPE - HIGH DENSITY POLYETHYLENE
HORIZ - HORIZONTAL
INV - INVERT
LF - LINEAR FEET
MECH - MECHANICAL
MH - MANHOLE
MIN - MINIMUM
MIN S - MINIMUM SLOPE
MJ - MECHANICAL JOINT
NIC - NOT IN CONTRACT
OHE - OVERHEAD ELECTRIC
OHP- OVERHEAD POWER
OHT - OVERHEAD TELEPHONE
PB - PLAT BOOK
PC - POINT OF CURVATURE
PED - PEDESTAL
PG - PAGE
PH - PHASE
PI - POINT OF INTERSECTION
PKG - PARKING
P/L - PROPERTY LINE
PT - POINT OF TANGENT
PP - POWER POLE
PVC - POLYVINYL CHLORIDE
PVMT - PAVEMENT
PWR - POWER
RD - ROOF DRAIN
RJ - RESTRAINED JOINT
R/W - RIGHT-OF-WAY
REQ'D - REQUIRED
RCP - REINFORCED CONCRETE PIPE
S - SLOPE
SAN - SANITARY SEWER
SDWK - SIDEWALK
SF - SILT FENCE
SPT - SPOT GRADE
SS - SANITARY SEWER CONNECTION
STA - STATION
STD - STANDARD
STM - STORM
STMH - STORM SEWER MANHOLE
T - TELEPHONE
TCM - TELECOMMUNICATIONS MANHOLE
T/C - TOP OF CURB
TEL - TELEPHONE
UGE - UNDERGROUND ELECTRIC
UNK - UNKNOWN
UP - UTILITY POLE
VAR - VARIABLE
VERT - VERTICAL
W/ - WITH
W/L - WATER LINE
W - WATER
WUS - WATERS OF THE US
X-ING - CROSSING
Ø - DIAMETER

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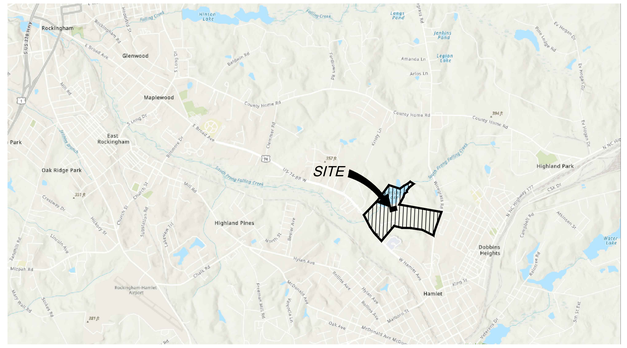

VICINITY MAP
NOT TO SCALE

DRAWING INDEX

TOTAL DRAWINGS = 10

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SCO #22-25472-01A
NCCCS #2689

LEGEND

SEWER

- EXISTING SANITARY SEWER (8" SAN)
- SANITARY SEWER (8"SAN)
- SANITARY MANHOLE NUMBER W/ COORDINATE LOCATION (1 / N 7605.80 E 9378.25)
- EX SANITARY MANHOLE
- SANITARY MANHOLE
- EXISTING CLEAN OUT
- CLEAN OUT

WATER

- EXISTING WATER LINE (8" W)
- WATER LINE (8"W)
- EXISTING WATER VALVE
- WATER VALVE
- POST INDICATOR VALVE
- EXISTING WATER METER
- WATER METER
- EXISTING FIRE HYDRANT
- FIRE HYDRANT
- WATER LINE REDUCER
- EX WATER LINE PLUG (8" W)
- WATER LINE PLUG (8"W)
- WATER LINE CROSS
- WATER LINE TEE
- FIRE DEPT CONNECTION
- WATER SPIGOT
- EXISTING WELL CASING

NATURAL GAS

- EXISTING GAS METER
- EXISTING GAS VALVE
- EXISTING GAS LINE (G)
- GAS LINE (G)

MISCELLANEOUS UTILITIES

- EXISTING LIGHT POLE
- EXISTING YARD LIGHT
- EXISTING GROUND LIGHT
- LIGHT POLES
- EXISTING UTILITY POLE
- UTILITY POLE
- EXISTING GUY WIRE
- EXISTING ELECTRIC METER
- EXISTING OVERHEAD ELECTRIC (OHP)
- OVERHEAD ELECTRIC (OHP)
- EX UNDERGROUND ELECT LINE (UGP)
- UNDERGROUND ELECTRIC LINE (UGP)
- EXISTING TELEPHONE PEDESTAL
- EXISTING TELEPHONE MANHOLE
- EX OVERHEAD TELEPHONE LINE (OHT)
- OVERHEAD TELEPHONE LINE (OHT)
- EX UNDERGROUND TELEPHONE LINE (UGT)
- UNDERGROUND TELEPHONE LINE (UGT)
- EX OVERHEAD FIBER OPTIC LINE (OFO)
- OVERHEAD FIBER OPTIC LINE (OFO)
- EX UNDERGROUND FIBER OPTIC LINE (UFO)
- UNDERGROUND FIBER OPTIC LINE (UFO)
- EX CABLE TV PEDESTAL
- EX OVERHEAD CABLE TV LINE (OCATV)
- OVERHEAD CABLE TV LINE (OCATV)
- EX UNDERGROUND CABLE TV (UCATV)
- UNDERGROUND CABLE TV LINE (UCATV)
- COMBINED POWER/CATV (UG P/C)
- COMBINED POWER, TELE, CATV (UG P/T/C)
- COMBINED POWER, TELEPHONE (UG P/T)
- COMBINED TELEPHONE, CATV (UG T/C)

SITE

- EXISTING STORM SEWER
- STORM SEWER
- EX DROP INLET
- DROP INLET & STRUCTURE NUMBER (1)
- EXISTING STORM SEWER MANHOLE
- STORM SEWER MANHOLE
- EXISTING ROOF DRAIN DOWNSPOUT
- ROOF DRAIN DOWNSPOUT
- EXISTING CURB
- CURB
- EXISTING CURB & GUTTER
- CURB & CUTTER
- PROPERTY LINE
- BENCH MARK (DESCRIPTION / ELEVATION, B-1)
- APPROX BORING LOCATION
- LIMITS OF CONSTRUCTION
- EXISTING TREE LINE
- CLEARING LIMITS
- EXISTING SHRUB
- EXISTING TREE
- EXISTING FENCE (X)
- FENCE (X)
- EXISTING CONTOUR (200)
- CONTOUR (200)
- SPOT ELEVATION (T/C 95.32, E/P 95.32, SWL 95.32)
- C/L SWALE
- EXISTING SIGN
- SIGN
- BOLLARD
- EXISTING FLAG POLE
- PROPERTY MARKER FOUND / ROD FOUND
- PIPE FOUND

GENERAL NOTES:

1. SITE ADDRESS: 1042 W. HAMLET AVE. HAMLET, NC 28345
2. TOTAL SITE AREA: 2.25 ACRES (PORTION OF 168 ACRE PARCEL)
3. DISTURBED ACREAGE: 0.99 ACRE
4. NEW BUILT UPON AREA: BUA %: 1.04 AC (0.37 AC EXIST. TO REMAIN + 0.67 AC PROP.) / 168 AC) = 0.62%
5. USE:
   EXISTING USE: COLLEGE
   PROPOSED USE: COLLEGE
6. PARCEL ID NUMBER: 748204715696
7. FEMA: PANEL 3710748200J DATED 10/16/2007
   PARCEL IS LOCATED IN ZONE 'X'

   PROJECT SITE LOCATED IN FLOOD ZONE AE, AS SHOWN ON FIRM MAP 3710748200J DATED 10/16/2007.
8. PARKING:
   REQUIRED: REGULAR = 11 SPACES
   HANDICAP = 1 SPACE (PER ADAAG)
   TOTAL = 12 SPACES (4 SPACES PER SERVICE BAY)
   PER CITY OF HAMLET ZONING ORDINANCE

   ACCESSIBLE SPACES REQUIRED FOR 135 TOTAL SPACES PROVIDED = 5 SPACES
   PER SECTION 1106 OF THE 2018 NCBC

   PROVIDED: REGULAR = 130 SPACES
   HANDICAP = 5 SPACES (3 VAN-ACCESSIBLE)
   TOTAL = 135 SPACES

PROPERTY OWNER

RICHMOND COMMUNITY COLLEGE
1042 W. HAMLET AVENUE
HAMLET, NORTH CAROLINA 28345
CONTACT: BRENT BARBEE
PHONE: (910) 410-1809
EMAIL: BTBARBEE@RICHMONDCC.EDU

CIVIL

TIMMONS GROUP
610 EAST MOREHEAD STREET, SUITE 250
CHARLOTTE, NORTH CAROLINA 28202
CONTACT: BRIAN CRUTCHFIELD
PHONE: (704) 376-1073
EMAIL: BRIAN.CRUTCHFIELD@TIMMONS.COM

ARCHITECT

ADW ARCHITECTS
2815 COLISEUM CENTRE DRIVE SUITE 500
CHARLOTTE, NORTH CAROLINA 28217
CONTACT: JONATHAN KORICKE
PHONE: (704) 749-5588
EMAIL: JKORICKE@ADWARCHITECTS.COM

RCC HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 West Hamlet Ave, Hamlet, NC 28345

BID DOCUMENTS

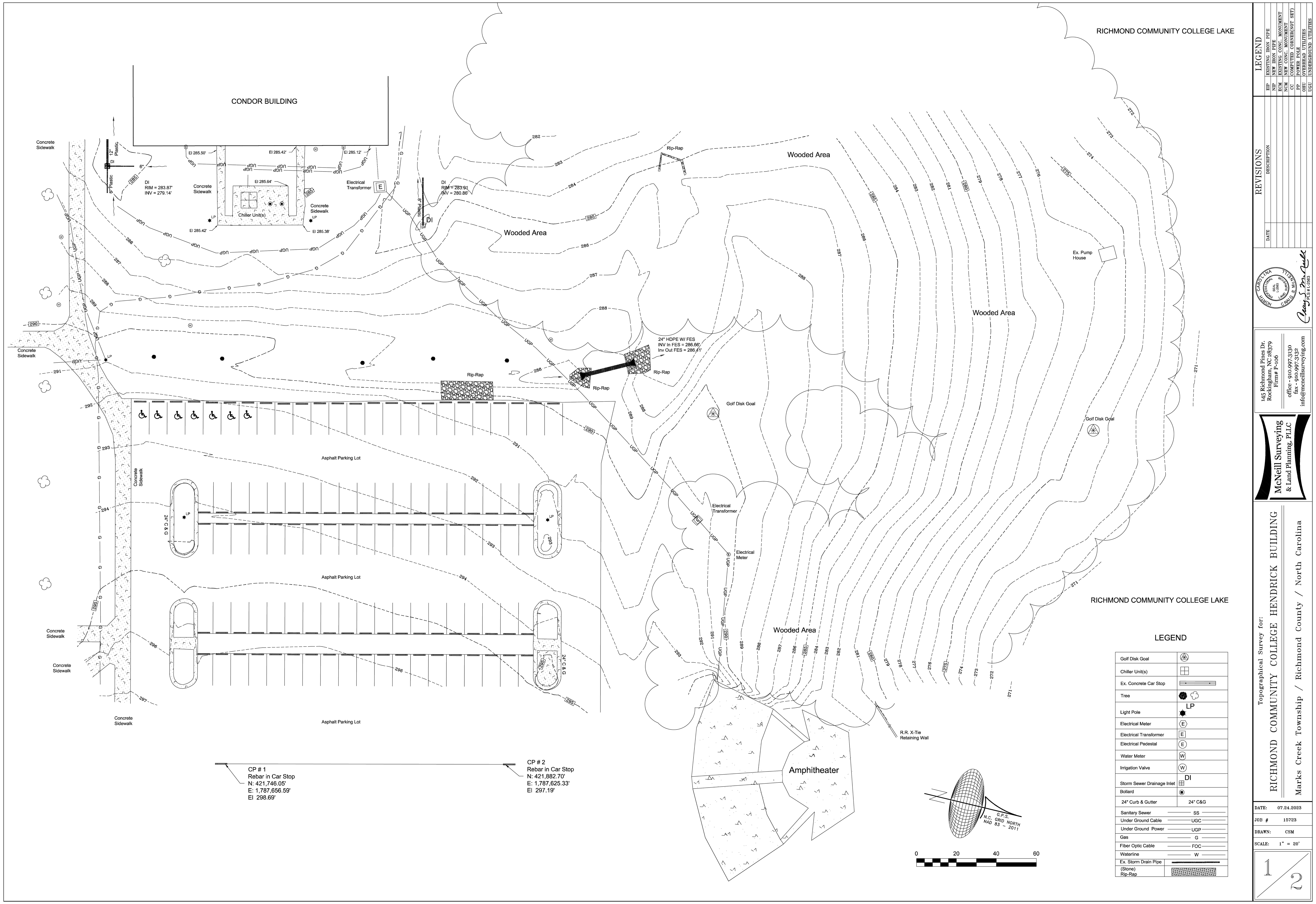
COVER

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER

C000



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SCO #22-25472-01A
NCCCS #2689

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SITE SURVEY

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
SS100

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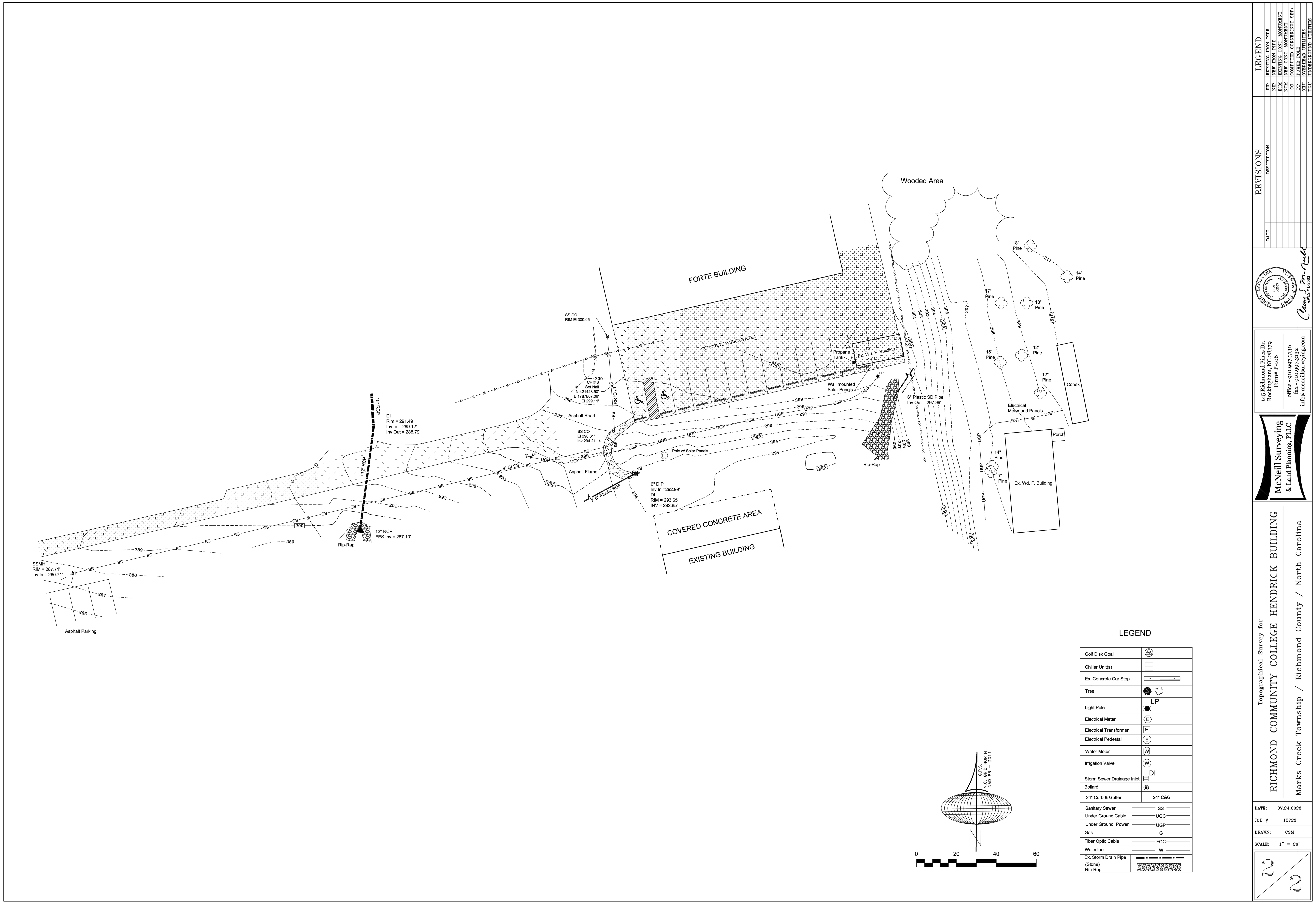

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SITE SURVEY

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER

SS101

DEMOLITION NOTES

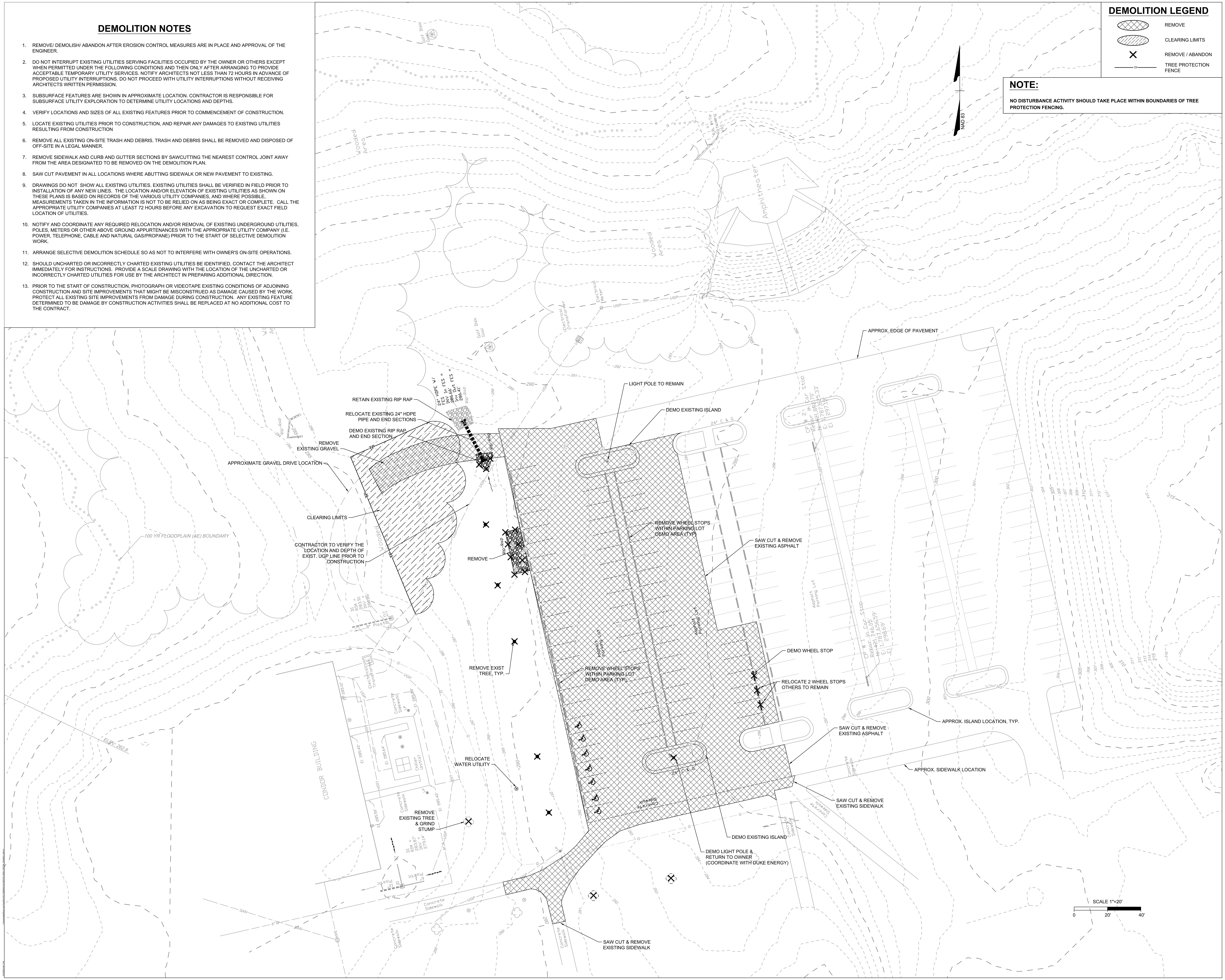
1. REMOVE/ DEMOLISH/ ABANDON AFTER EROSION CONTROL MEASURES ARE IN PLACE AND APPROVAL OF THE ENGINEER.
2. DO NOT INTERRUPT EXISTING UTILITIES SERVING FACILITIES OCCUPIED BY THE OWNER OR OTHERS EXCEPT WHEN PERMITTED UNDER THE FOLLOWING CONDITIONS AND THEN ONLY AFTER ARRANGING TO PROVIDE ACCEPTABLE TEMPORARY UTILITY SERVICES. NOTIFY ARCHITECTS NOT LESS THAN 72 HOURS IN ADVANCE OF PROPOSED UTILITY INTERRUPTIONS. DO NOT PROCEED WITH UTILITY INTERRUPTIONS WITHOUT RECEIVING ARCHITECTS WRITTEN PERMISSION.
3. SUBSURFACE FEATURES ARE SHOWN IN APPROXIMATE LOCATION. CONTRACTOR IS RESPONSIBLE FOR SUBSURFACE UTILITY EXPLORATION TO DETERMINE UTILITY LOCATIONS AND DEPTHS.
4. VERIFY LOCATIONS AND SIZES OF ALL EXISTING FEATURES PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. LOCATE EXISTING UTILITIES PRIOR TO CONSTRUCTION, AND REPAIR ANY DAMAGES TO EXISTING UTILITIES RESULTING FROM CONSTRUCTION
6. REMOVE ALL EXISTING ON-SITE TRASH AND DEBRIS. TRASH AND DEBRIS SHALL BE REMOVED AND DISPOSED OF OFF-SITE IN A LEGAL MANNER.
7. REMOVE SIDEWALK AND CURB AND GUTTER SECTIONS BY SAWCUTTING THE NEAREST CONTROL JOINT AWAY FROM THE AREA DESIGNATED TO BE REMOVED ON THE DEMOLITION PLAN.
8. SAW CUT PAVEMENT IN ALL LOCATIONS WHERE ABUTTING SIDEWALK OR NEW PAVEMENT TO EXISTING.
9. DRAWINGS DO NOT SHOW ALL EXISTING UTILITIES. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES. 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 INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES.
10. NOTIFY AND COORDINATE ANY REQUIRED RELOCATION AND/OR REMOVAL OF EXISTING UNDERGROUND UTILITIES, POLES, METERS OR OTHER ABOVE GROUND APPURTENANCES WITH THE APPROPRIATE UTILITY COMPANY (I.E. POWER, TELEPHONE, CABLE AND NATURAL GAS/PROPANE) PRIOR TO THE START OF SELECTIVE DEMOLITION WORK.
11. ARRANGE SELECTIVE DEMOLITION SCHEDULE SO AS NOT TO INTERFERE WITH OWNER'S ON-SITE OPERATIONS.
12. SHOULD UNCHARTED OR INCORRECTLY CHARTED EXISTING UTILITIES BE IDENTIFIED, CONTACT THE ARCHITECT IMMEDIATELY FOR INSTRUCTIONS. PROVIDE A SCALE DRAWING WITH THE LOCATION OF THE UNCHARTED OR INCORRECTLY CHARTED UTILITIES FOR USE BY THE ARCHITECT IN PREPARING ADDITIONAL DIRECTION.
13. PRIOR TO THE START OF CONSTRUCTION, PHOTOGRAPH OR VIDEOTAPE EXISTING CONDITIONS OF ADJOINING CONSTRUCTION AND SITE IMPROVEMENTS THAT MIGHT BE MISCONSTRUED AS DAMAGE CAUSED BY THE WORK. PROTECT ALL EXISTING SITE IMPROVEMENTS FROM DAMAGE DURING CONSTRUCTION. ANY EXISTING FEATURE DETERMINED TO BE DAMAGE BY CONSTRUCTION ACTIVITIES SHALL BE REPLACED AT NO ADDITIONAL COST TO THE CONTRACT.

DEMOLITION LEGEND

- REMOVE
- CLEARING LIMITS
- × REMOVE / ABANDON
- —TP— TREE PROTECTION FENCE

NOTE:

NO DISTURBANCE ACTIVITY SHOULD TAKE PLACE WITHIN BOUNDARIES OF TREE PROTECTION FENCING.



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RCC HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 West Hamlet Ave,
Hamlet, NC 28345

NORTH CAROLINA PROFESSIONAL SEAL 34288 ENGINEER BRIAN V. CRUTCHFIELD 3-3-25

BID DOCUMENTS

EXISTING CONDITIONS AND DEMOLITION PLAN

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS
NO: DATE: DESCRIPTION:

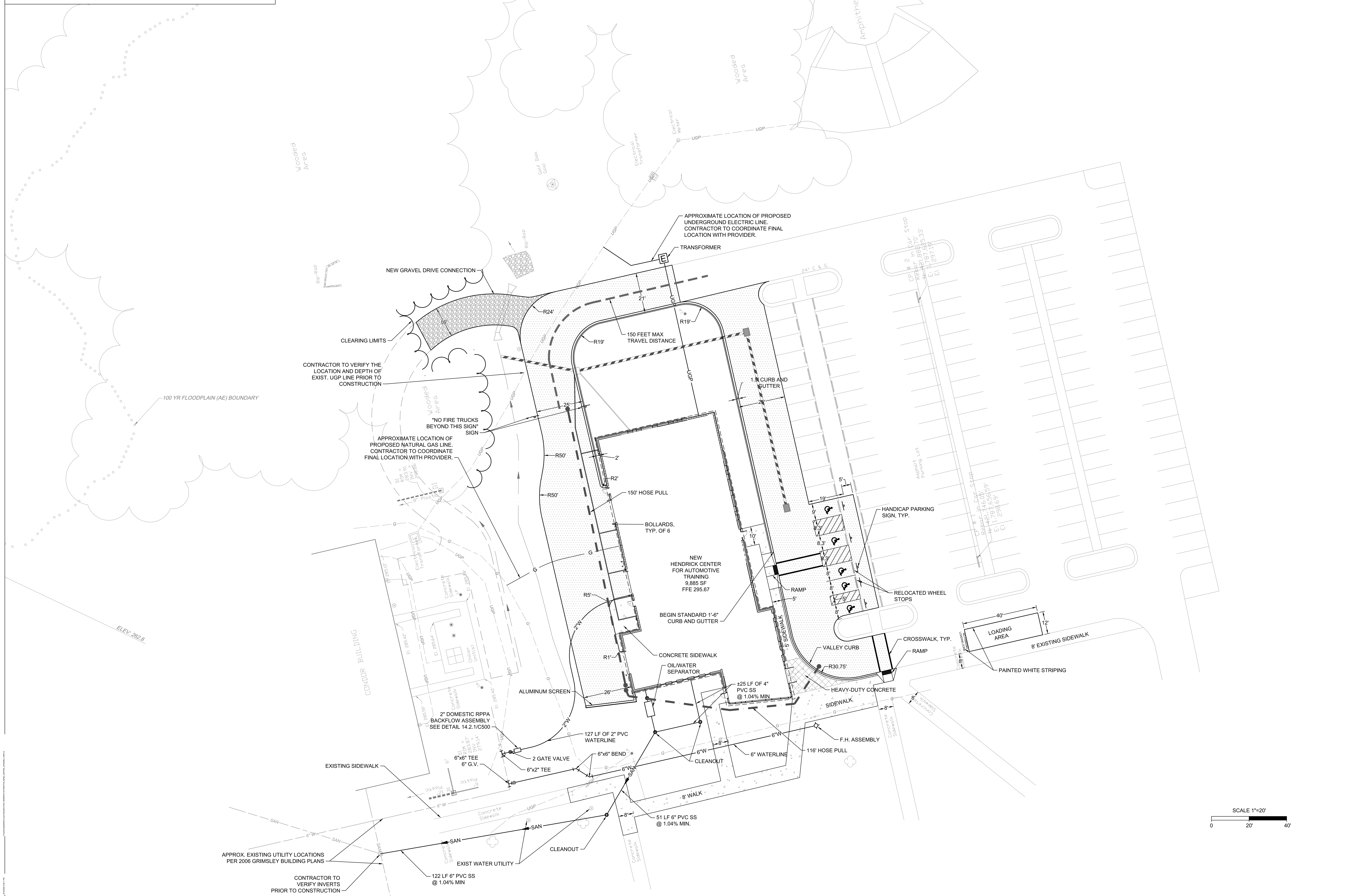
SHEET NUMBER
C100

GENERAL NOTES:

1.	SITE ADDRESS:	1042 WEST HAMLET AVE, HAMLET, NC 28345
2.	PARCEL ID NUMBER:	748204715696
3.	BUILDING HEIGHT:	(1 STORY)
4.	BUILDING AREA:	9,372 SF (9,879 GROSS SF)
5.	WATERSHED OVERLAY DISTRICT:	NONE
6.	FEMA:	PANEL 3710748200J DATED 10/16/2007 SITE WORK IS LOCATED IN ZONE 'X'. PORTIONS OF SITE WHERE NO WORK IS BEING PERFORMED ARE LOCATED IN FLOOD ZONE AE, AS SHOWN ON FIRM MAP 3710748200J DATED 10/16/2007.
7.	PARKING: REQUIRED:	REGULAR = 11 SPACES HANDICAP = 1 SPACE (PER ADAAG) **TOTAL** = 12 SPACES (4 SPACES PER SERVICE BAY) PER CITY OF HAMLET ZONING ORDINANCE ACCESSIBLE SPACES REQUIRED FOR 135 TOTAL SPACES PROVIDED = 5 SPACES PER SECTION 1106 OF THE 2018 NCBC
	PROVIDED:	REGULAR = 130 SPACES HANDICAP = 5 SPACES (3 VAN-ACCESSIBLE) **TOTAL** = 135 SPACES

MATERIALS LEGEND

- CONCRETE SIDEWALKS
- LIGHT DUTY ASPHALT
- GRAVEL
- HEAVY-DUTY CONCRETE



NAD 83
Wooded Area
Amphitheater
Electrical Transformer
Electric Meter
UGP
100 YR FLOODPLAIN (AE) BOUNDARY
ELEV: 262.8
APPROXIMATE LOCATION OF PROPOSED UNDERGROUND ELECTRIC LINE. CONTRACTOR TO COORDINATE FINAL LOCATION WITH PROVIDER.
TRANSFORMER
NEW GRAVEL DRIVE CONNECTION
R24'
21'
R19'
150 FEET MAX TRAVEL DISTANCE
CLEARING LIMITS
CONTRACTOR TO VERIFY THE LOCATION AND DEPTH OF EXIST. UGP LINE PRIOR TO CONSTRUCTION
1.5' CURB AND GUTTER
25'
"NO FIRE TRUCKS BEYOND THIS SIGN" SIGN
APPROXIMATE LOCATION OF PROPOSED NATURAL GAS LINE. CONTRACTOR TO COORDINATE FINAL LOCATION WITH PROVIDER.
R50'
2'
R2'
150' HOSE PULL
BOLLARDS, TYP. OF 6
NEW HENDRICK CENTER FOR AUTOMOTIVE TRAINING 9,885 SF FFE 295.67
24" C & G
CP # 2 Rebar in Car Stop
Asphalt Parking Lot
CP # 1 Rebar in Car Stop
HANDICAP PARKING SIGN, TYP.
19'
5'
9'
8.3'
8'
10'
RAMP
RELOCATED WHEEL STOPS
BEGIN STANDARD 1'-6" CURB AND GUTTER
5' SIDEWALK
CONCRETE SIDEWALK
VALLEY CURB
R30.75'
CROSSWALK, TYP.
RAMP
40'
12'
LOADING AREA
8' EXISTING SIDEWALK
PAINTED WHITE STRIPING
HEAVY-DUTY CONCRETE
SIDEWALK
R5'
R1'
2"W
OIL/WATER SEPARATOR
±25 LF OF 4" PVC SS @ 1.04% MIN
ALUMINUM SCREEN
26'
CONDOR BUILDING
Chiller Unit(s)
Concrete Sidewalk
2" DOMESTIC RPPA BACKFLOW ASSEMBLY SEE DETAIL 14.2.1/C500
127 LF OF 2" PVC WATERLINE
F.H. ASSEMBLY
6"W
6" WATERLINE
116' HOSE PULL
6"x6" TEE
6" G.V.
2 GATE VALVE
6"x2" TEE
6"x6" BEND
CLEANOUT
EXISTING SIDEWALK
8' WALK
51 LF 6" PVC SS @ 1.04% MIN.
SAN
CLEANOUT
EXIST WATER UTILITY
APPROX. EXISTING UTILITY LOCATIONS PER 2006 GRIMSLEY BUILDING PLANS
CONTRACTOR TO VERIFY INVERTS PRIOR TO CONSTRUCTION
122 LF 6" PVC SS @ 1.04% MIN
SCALE 1"=20'
0
20'
40'

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SEAL 34280

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SITE & UTILITY PLAN

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS

NO:	DATE:	DESCRIPTION:
1	12/16/2024	SCO COMMENTS
2	02/10/2025	SCO COMMENTS

SHEET NUMBER
C200

GROUND STABILIZATION

SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME EXCEPTIONS
• PERIMETER DIKES, SWALES, DITCHES, AND SLOPES	7 DAYS	NONE
• HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
• SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1 14 DAYS ARE ALLOWED
• SLOPES 3:1 OR FLATTER	14 DAYS	7-DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
• ALL OTHER AREA WITH SLOPE FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)

* "EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE." (SECTION II. B (2)(b))

NPDES GROUND STABILIZATION:

SOIL STABILIZATION SHALL BE ACHIEVED ON ANY AREA OF A SITE WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARY OR PERMANENTLY CEASED ACCORDING TO THE FOLLOWING SCHEDULE:

1. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEPPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.
2. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBANCE ACTIVITY.

NOTE:

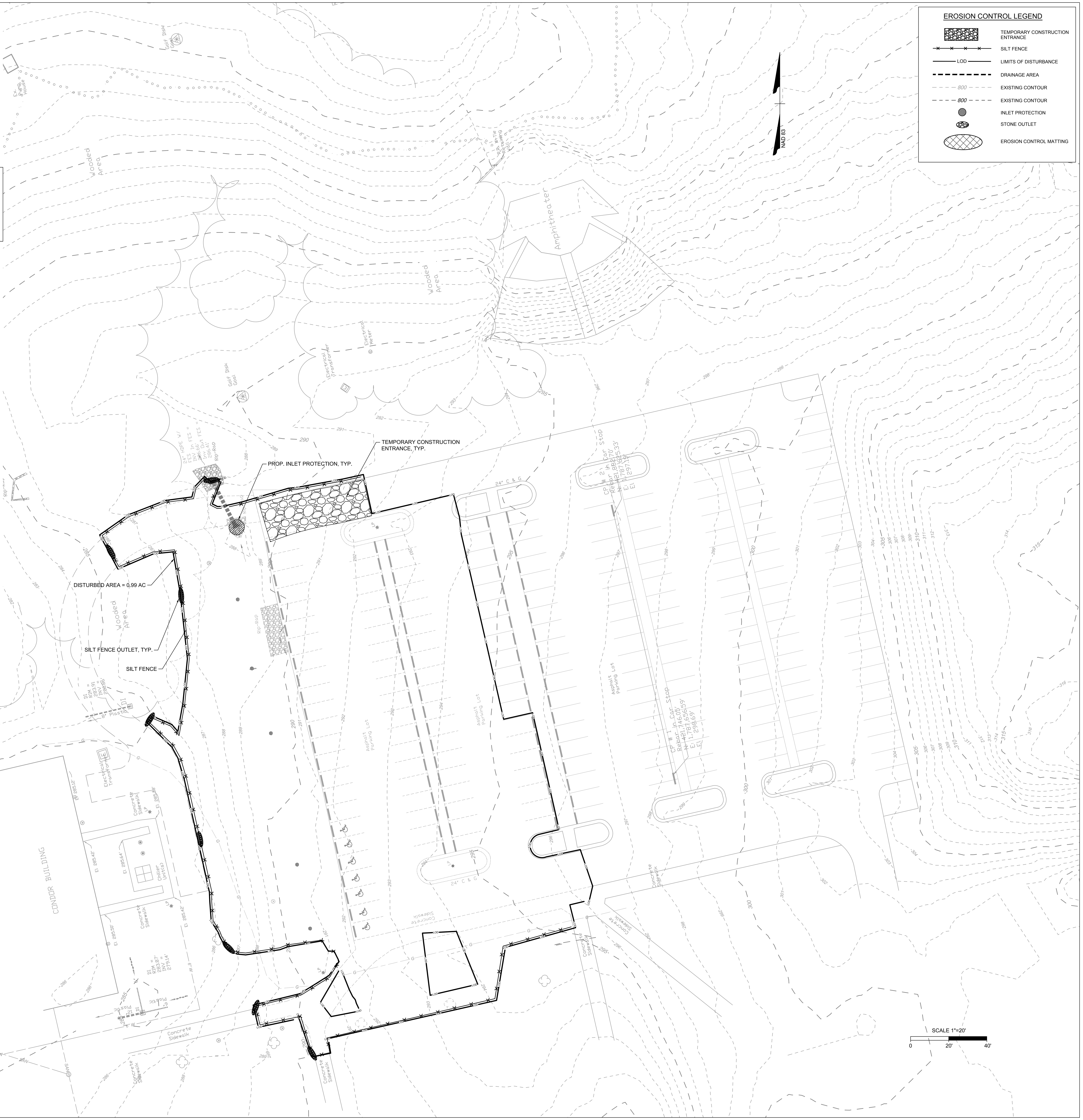
1. SILT FENCE OUTLETS SHALL BE PROVIDED ALONG ALL LOW POINTS OF SILT FENCE AND AREAS WHERE RUNOFF MAY CONCENTRATE CAUSING DAMAGE TO SILT FENCE. CONTRACTOR SHALL INSTALL OUTLETS AS NECESSARY TO ENSURE SILT FENCE IS FULLY FUNCTIONAL THROUGHOUT THE DURATION OF CONSTRUCTION.
2. THE NPDES CONSTRUCTION PERMIT REQUIRES EROSION AND SEDIMENT CONTROL DEVICES AND STORM WATER OUTFALLS BE INSPECTED WEEKLY (EVERY 7 CALENDAR DAYS) AND WITHIN 24 HRS OF A .5 INCH RAIN EVENT. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT THESE INSPECTIONS AND MAINTAIN RECORDS UNTIL THE AREA HAS STABILIZED, EVIDENT BY 80% VEGETATIVE GROWTH FOR AREAS PROVIDED SEEDING. TO FACILITATE RAINFALL MONITORING A RAIN GAUGE IS REQUIRED TO BE ON SITE. ADDITIONALLY THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING “SELF INSPECTIONS” INDICATING THE DATE BMPS ARE INSTALLED AND STABILIZATION MEASURES (SEEDING/MULCHING OR SOD) ARE INITIATED. THE “SELF INSPECTION” REPORTS WILL BE MAINTAINED ALONG WITH THE “NPDES” INSPECTION REPORTS. ONCE STABILIZATION HAS BEEN ACCOMPLISHED INSPECTION RECORDS ARE TO BE FORWARDED TO EAD AND ALL TEMPORARY EROSION/SEDIMENTATION CONTROL DEVICES REMOVED. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING COMPLIANCE WITH ALL PERMITS AND PLANS, ANY CHANGES WILL BE APPROVED BY THE STATE PRIOR TO EXECUTION. A COPY OF THE EROSION AND SEDIMENTATION CONTROL PLAN, LETTER OF APPROVAL, AND NPDES CONSTRUCTION PERMIT WILL BE MAINTAINED BY THE CONTRACTOR AT THE ONSITE OFFICE. IF SOIL IS REMOVED FROM OR BROUGHT ONSITE, THE APPLICABLE SOLID WASTE MANAGEMENT PERMIT NUMBER, EROSION SEDIMENTATION PERMIT NUMBER OR MINE PERMIT NUMBER WILL BE DISCLOSED.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. REFER TO EXISTING CONDITIONS AND DEMOLITION PLAN.
2. EXCAVATION AND EARTH MOVING OPERATIONS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE GEOTECHNICAL ENGINEER.
3. ALL CONSTRUCTION SHALL COMPLY WITH NCDENR STANDARDS AND SPECIFICATIONS.
4. FOOTING EXCAVATION SHALL BE CONTINUOUSLY DETWATERED TO PREVENT SETTLEMENT AND SEDIMENT DEPOSITION. ENSURE THAT THE BUILDING PAD IS CONSTRUCTED WITH SUITABLE MATERIAL AS PER THE GEOTECHNICAL ENGINEERS DIRECTION.
5. VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. EXISTING UTILITIES SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND FROM A SURVEY OF THE ABOVE GROUND FEATURES. NO WARRANTY IS GIVEN OR IMPLIED AS TO THE ACCURACY OF THE INFORMATION. ALL EXISTING UTILITIES SHOULD BE CONSIDERED APPROXIMATE IN LOCATION AND VERIFIED PRIOR TO COMMENCING ACTIVITY ON SITE.
6. STABILIZE DISTURBED AREAS WITH TEMPORARY VEGETATION. DENUDED AREA MUST BE SEEDED WITH FOURTEEN (14) DAYS OF COMPLETION OF ANY PHASE OF CONSTRUCTION. HYDROSEEDING REQUIRED ON ALL SLOPES 3:1 OR GREATER.
7. ENSURE THAT ALL TEMPORARY DIVERSIONS ARE INSTALLED WITH POSITIVE DRAINAGE AND SHALL OPPOSE EXISTING GRADE WHEN NECESSARY TO PROVIDE A MINIMUM OF 0.5% LONGITUDINAL SLOPE.
8. ALL ADJACENT ROADS TO THE SITE SHALL BE SWEPT AND WASHED AT THE END OF EACH WORK DAY TO ENSURE NO SEDIMENT COLLECTS ON THE ROADWAYS.
9. INSPECT AND PROPERLY MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES WEEKLY AND AFTER EACH RAINFALL EVENT.
10. INSTALL ANY ADDITIONAL EROSION CONTROL MEASURE AS NECESSARY TO PREVENT SEDIMENT RUNOFF.

EROSION CONTROL SEQUENCE - PHASE 1

1. OBTAIN ALL NECESSARY PERMITS FROM THE PROPER AUTHORITIES.
2. INSTALL CONSTRUCTION ENTRANCE AND EROSION CONTROL MEASURES AS SHOWN ON THE PLAN IN ACCORDANCE WITH THE LATEST NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING DESIGN MANUAL. ANY SEDIMENT ACCUMULATION ON ADJACENT PUBLIC ROADS AS A RESULT OF THE PROJECT AND TRAFFIC FROM THE PROJECT SHALL BE IMMEDIATELY CLEANED OFF BY THE CONTRACTOR.
3. DEMO SIDEWALKS AND PARKING AS INDICATED ON THE SITE DEMO PLAN.
4. INSTALL ADDITIONAL PERMANENT SWALES AND TEMPORARY DIVERSION SWALES AS REQUIRED TO INTERSECT RUNOFF AS SITE IS BROUGHT UP TO GRADE. MAINTAIN POSITIVE DRAINAGE ALONG SWALES AND DIVERSIONS AT ALL TIMES DURING CONSTRUCTION. PROVIDE PUMPS TO DIVERT WATER TO APPROPRIATE EROSION CONTROL MEASURE AS NECESSARY IF POSITIVE SLOPE CAN NOT BE ACHIEVED. TEMPORARY SLOPE DRAINS ARE TO BE INSTALLED TO CONNECT PERMANENT SWALES AND TEMPORARY DIVERSION SWALES OVER STEEP SLOPES.
5. ONCE ALL DEMOLITION HAS BEEN COMPLETED CONTACT OWNER'S ENGINEER AND EROSION CONTROL INSPECTOR FOR SITE INSPECTION. AFTER APPROVAL, BEGIN CONSTRUCTION OF PHASE 2. DO NOT BEGIN PHASE 2 CONSTRUCTION WITHOUT APPROVAL OF OWNER'S ENGINEER.



EROSION CONTROL LEGEND

TEMPORARY CONSTRUCTION ENTRANCE	
SILT FENCE	
LOD	LIMITS OF DISTURBANCE
	DRAINAGE AREA
800	EXISTING CONTOUR
800	EXISTING CONTOUR
	INLET PROTECTION
	STONE OUTLET
	EROSION CONTROL MATTING

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EROSION CONTROL PHASE 1

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS

NO: DATE: DESCRIPTION:

SHEET NUMBER

C300

GROUND STABILIZATION		
SITE AREA DESCRIPTION	STABILIZATION TIME FRAME	STABILIZATION TIME EXCEPTIONS
• PERIMETER DIKES, SWALES, DITCHES, AND SLOPES	7 DAYS	NONE
• HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
• SLOPES STEEPER THAN 3:1	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1 14 DAYS ARE ALLOWED
• SLOPES 3:1 OR FLATTER	14 DAYS	7-DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH
• ALL OTHER AREA WITH SLOPE FLATTER THAN 4:1	14 DAYS	NONE (EXCEPT FOR PERIMETERS AND HQW ZONES)

* "EXTENSIONS OF TIME MAY BE APPROVED BY THE PERMITTING AUTHORITY BASED ON WEATHER OR OTHER SITE-SPECIFIC CONDITIONS THAT MAKE COMPLIANCE IMPRACTICABLE." (SECTION II. B (2)(b))

NPDES GROUND STABILIZATION:

SOIL STABILIZATION SHALL BE ACHIEVED ON ANY AREA OF A SITE WHERE LAND-DISTURBING ACTIVITIES HAVE TEMPORARY OR PERMANENTLY CEASED ACCORDING TO THE FOLLOWING SCHEDULE:

1. ALL PERIMETER DIKES, SWALES, DITCHES, PERIMETER SLOPES AND ALL SLOPES STEPPER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 7 CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY.

2. ALL OTHER DISTURBED AREAS SHALL BE PROVIDED TEMPORARY OR PERMANENT STABILIZATION WITH GROUND COVER AS SOON AS PRACTICABLE BUT IN ANY EVENT WITHIN 14 CALENDAR DAYS FROM THE LAST LAND-DISTURBANCE ACTIVITY.

NOTE:

1. SILT FENCE OUTLETS SHALL BE PROVIDED ALONG ALL LOW POINTS OF SILT FENCE AND AREAS WHERE RUNOFF MAY CONCENTRATE CAUSING DAMAGE TO SILT FENCE. CONTRACTOR SHALL INSTALL OUTLETS AS NECESSARY TO ENSURE SILT FENCE IS FULLY FUNCTIONAL THROUGHOUT THE DURATION OF CONSTRUCTION.

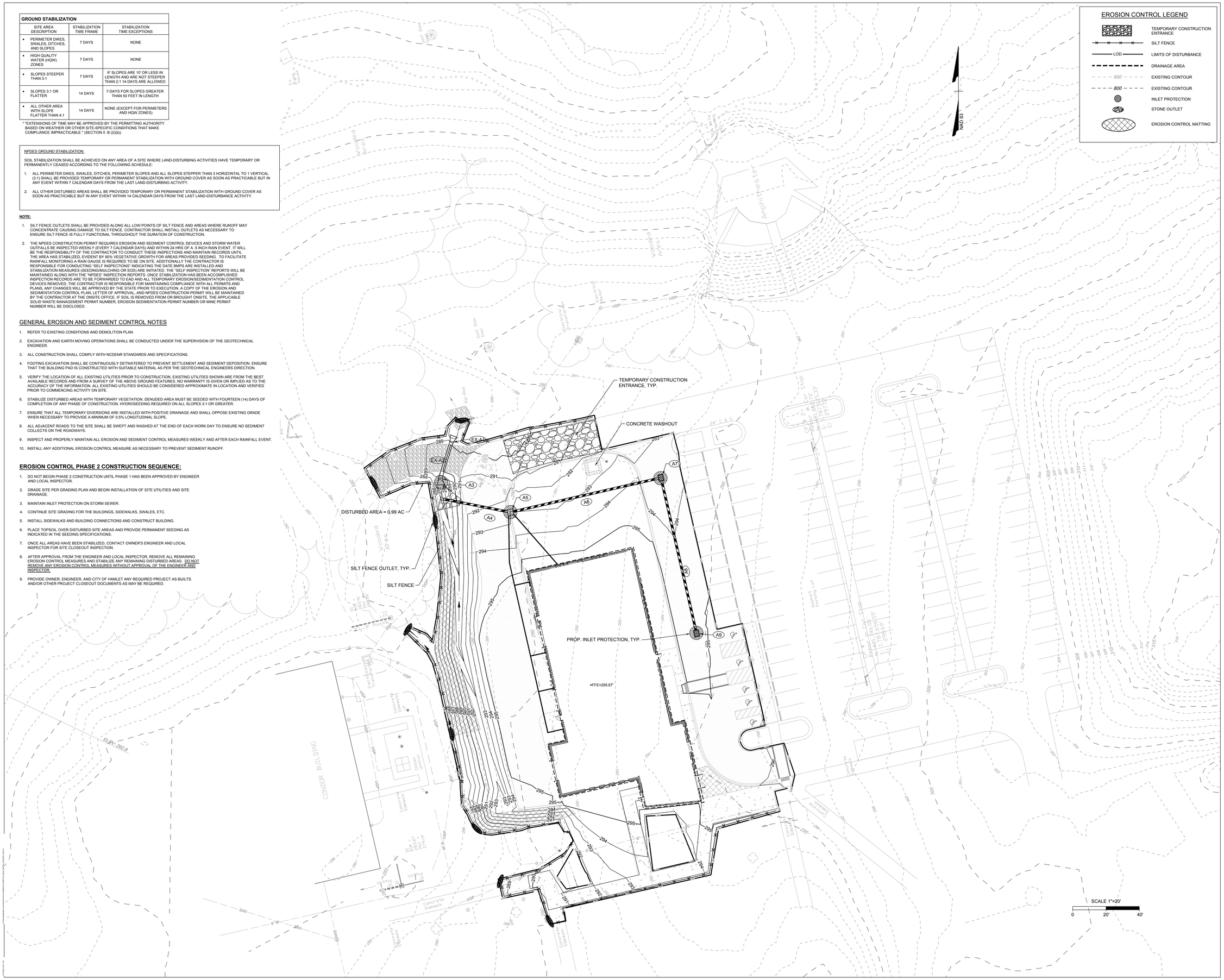
2. THE NPDES CONSTRUCTION PERMIT REQUIRES EROSION AND SEDIMENT CONTROL DEVICES AND STORM WATER OUTFALLS BE INSPECTED WEEKLY (EVERY 7 CALENDAR DAYS) AND WITHIN 24 HRS OF A .5 INCH RAIN EVENT. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONDUCT THESE INSPECTIONS AND MAINTAIN RECORDS UNTIL THE AREA HAS STABILIZED, EVIDENT BY 80% VEGETATIVE GROWTH FOR AREAS PROVIDED SEEDING. TO FACILITATE RAINFALL MONITORING A RAIN GAUGE IS REQUIRED TO BE ON SITE. ADDITIONALLY THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING "SELF INSPECTIONS" INDICATING THE DATE BMPS ARE INSTALLED AND STABILIZATION MEASURES (SEEDING/MULCHING OR SOD) ARE INITIATED. THE "SELF INSPECTION" REPORTS WILL BE MAINTAINED ALONG WITH THE "NPDES" INSPECTION REPORTS. ONCE STABILIZATION HAS BEEN ACCOMPLISHED INSPECTION RECORDS ARE TO BE FORWARDED TO EAD AND ALL TEMPORARY EROSION/SEDIMENTATION CONTROL DEVICES REMOVED. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING COMPLIANCE WITH ALL PERMITS AND PLANS, ANY CHANGES WILL BE APPROVED BY THE STATE PRIOR TO EXECUTION. A COPY OF THE EROSION AND SEDIMENTATION CONTROL PLAN, LETTER OF APPROVAL, AND NPDES CONSTRUCTION PERMIT WILL BE MAINTAINED BY THE CONTRACTOR AT THE ONSITE OFFICE. IF SOIL IS REMOVED FROM OR BROUGHT ONSITE, THE APPLICABLE SOLID WASTE MANAGEMENT PERMIT NUMBER, EROSION SEDIMENTATION PERMIT NUMBER OR MINE PERMIT NUMBER WILL BE DISCLOSED.

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. REFER TO EXISTING CONDITIONS AND DEMOLITION PLAN.
2. EXCAVATION AND EARTH MOVING OPERATIONS SHALL BE CONDUCTED UNDER THE SUPERVISION OF THE GEOTECHNICAL ENGINEER.
3. ALL CONSTRUCTION SHALL COMPLY WITH NCDENR STANDARDS AND SPECIFICATIONS.
4. FOOTING EXCAVATION SHALL BE CONTINUOUSLY DETWAITERED TO PREVENT SETTLEMENT AND SEDIMENT DEPOSITION. ENSURE THAT THE BUILDING PAD IS CONSTRUCTED WITH SUITABLE MATERIAL AS PER THE GEOTECHNICAL ENGINEERS DIRECTION.
5. VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. EXISTING UTILITIES SHOWN ARE FROM THE BEST AVAILABLE RECORDS AND FROM A SURVEY OF THE ABOVE GROUND FEATURES. NO WARRANTY IS GIVEN OR IMPLIED AS TO THE ACCURACY OF THE INFORMATION. ALL EXISTING UTILITIES SHOULD BE CONSIDERED APPROXIMATE IN LOCATION AND VERIFIED PRIOR TO COMMENCING ACTIVITY ON SITE.
6. STABILIZE DISTURBED AREAS WITH TEMPORARY VEGETATION. DENUDED AREA MUST BE SEEDED WITH FOURTEEN (14) DAYS OF COMPLETION OF ANY PHASE OF CONSTRUCTION. HYDROSEEDING REQUIRED ON ALL SLOPES 3:1 OR GREATER.
7. ENSURE THAT ALL TEMPORARY DIVERSIONS ARE INSTALLED WITH POSITIVE DRAINAGE AND SHALL OPPOSE EXISTING GRADE WHEN NECESSARY TO PROVIDE A MINIMUM OF 0.5% LONGITUDINAL SLOPE.
8. ALL ADJACENT ROADS TO THE SITE SHALL BE SWEPT AND WASHED AT THE END OF EACH WORK DAY TO ENSURE NO SEDIMENT COLLECTS ON THE ROADWAYS.
9. INSPECT AND PROPERLY MAINTAIN ALL EROSION AND SEDIMENT CONTROL MEASURES WEEKLY AND AFTER EACH RAINFALL EVENT.
10. INSTALL ANY ADDITIONAL EROSION CONTROL MEASURE AS NECESSARY TO PREVENT SEDIMENT RUNOFF.

EROSION CONTROL PHASE 2 CONSTRUCTION SEQUENCE:

1. DO NOT BEGIN PHASE 2 CONSTRUCTION UNTIL PHASE 1 HAS BEEN APPROVED BY ENGINEER AND LOCAL INSPECTOR.
2. GRADE SITE PER GRADING PLAN AND BEGIN INSTALLATION OF SITE UTILITIES AND SITE DRAINAGE.
3. MAINTAIN INLET PROTECTION ON STORM SEWER.
4. CONTINUE SITE GRADING FOR THE BUILDINGS, SIDEWALKS, SWALES, ETC.
5. INSTALL SIDEWALKS AND BUILDING CONNECTIONS AND CONSTRUCT BUILDING.
6. PLACE TOPSOIL OVER DISTURBED SITE AREAS AND PROVIDE PERMANENT SEEDING AS INDICATED IN THE SEEDING SPECIFICATIONS.
7. ONCE ALL AREAS HAVE BEEN STABILIZED, CONTACT OWNER'S ENGINEER AND LOCAL INSPECTOR FOR SITE CLOSEOUT INSPECTION.
8. AFTER APPROVAL FROM THE ENGINEER AND LOCAL INSPECTOR, REMOVE ALL REMAINING EROSION CONTROL MEASURES AND STABILIZE ANY REMAINING DISTURBED AREAS. DO NOT REMOVE ANY EROSION CONTROL MEASURES WITHOUT APPROVAL OF THE ENGINEER AND INSPECTOR.
9. PROVIDE OWNER, ENGINEER, AND CITY OF HAMLET ANY REQUIRED PROJECT AS-BUILTS AND/OR OTHER PROJECT CLOSEOUT DOCUMENTS AS MAY BE REQUIRED.



EROSION CONTROL LEGEND

- TEMPORARY CONSTRUCTION ENTRANCE
- SILT FENCE
- LOD — LIMITS OF DISTURBANCE
- DRAINAGE AREA
- 800 — EXISTING CONTOUR
- 800 — EXISTING CONTOUR
- INLET PROTECTION
- STONE OUTLET
- EROSION CONTROL MATTING

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1042 West Hamlet Ave,
Hamlet, NC 28345

SEAL 34288 ENGINEER BRYAN V. CRUTCHFIELD

BID DOCUMENTS

EROSION CONTROL PHASE 2

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS

NO:	DATE:	DESCRIPTION:

SHEET NUMBER

C301

GRADING AND DRAINAGE LEGEND

- EXISTING STORM SEWER
- PROPOSED STORM SEWER
- CATCH BASIN
- STORM CLEANOUT
- STORM MANHOLE
- 800 EXISTING CONTOUR
- PROPOSED CONTOUR
- RIP RAP
- TC 349.00' TOP OF CURB ELEVATION
- SG 349.00' PROPOSED SPOT ELEVATION
- SWK 349.00' SIDEWALK ELEVATION
- SAN PROPOSED SANITARY SEWER
- SAN EXISTING SANITARY SEWER
- W PROPOSED WATERMAIN
- W EXISTING WATERMAIN

STORM PIPE TABLE

PIPE #	DIA	FROM - TO	UPSTREAM INVERT	DOWNSTREAM INVERT	SLOPE	LENGTH	DESCRIPTION
A4	15"	A5 - N/A	288.04	287.78	0.64%	40.80 LF	15 inch RCP
A6	15"	A7 - A5	288.70	288.14	0.60%	92.73 LF	15 inch RCP
A8	15"	A9 - A7	289.41	288.80	0.64%	95.82 LF	15 inch RCP

STORM STRUCTURE TABLE

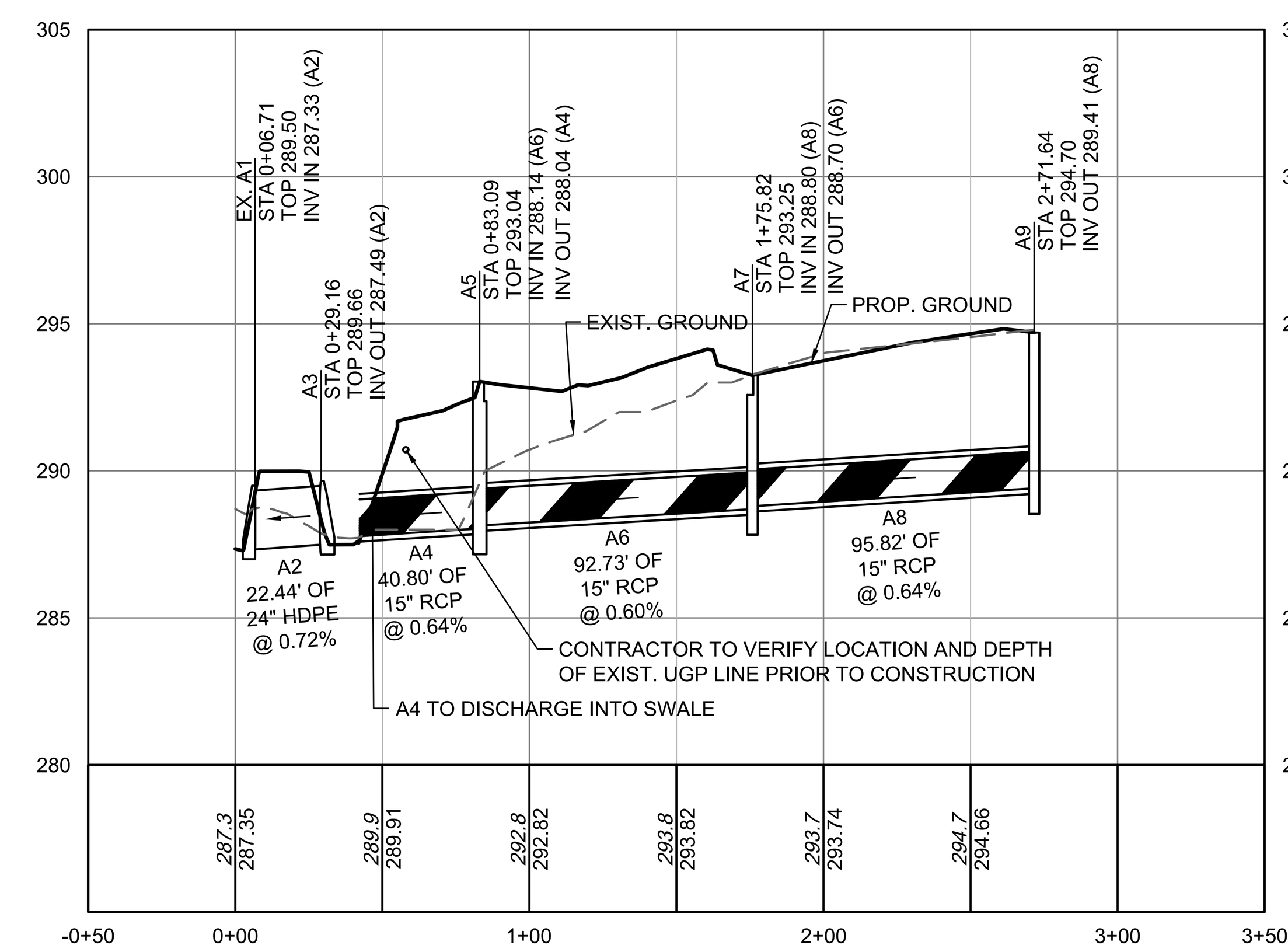
STRUCTURE #	TOP	STRUCTURE HEIGHT	DESCRIPTION
A5	293.04	5.00'	NCDOT 840.02 CONCRETE CATCH BASIN
A7	293.25	4.55'	NCDOT 840.14 CONCRETE DROP INLET
A9	294.70	5.29'	NCDOT 840.14 CONCRETE DROP INLET

STORM PIPE TABLE

PIPE #	DIA	FROM - TO	UPSTREAM INVERT	DOWNSTREAM INVERT	SLOPE	LENGTH	DESCRIPTION
A2	24"	A3 - EX. A1	287.49	287.33	0.72%	22.44 LF	24" HDPE

STORM STRUCTURE TABLE

STRUCTURE #	TOP	STRUCTURE HEIGHT	DESCRIPTION
A3	289.66	3.78'	NCDOT ES-1 for 24 inch Pipe
EX. A1	289.50	-	NCDOT ES-1 for 24 inch Pipe



A1 TO A9

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NORTH CAROLINA PROFESSIONAL SEAL 34288 ENGINEER BRIAN V. CRUTCHFIELD 3-3-25

BID DOCUMENTS

GRADING PLAN

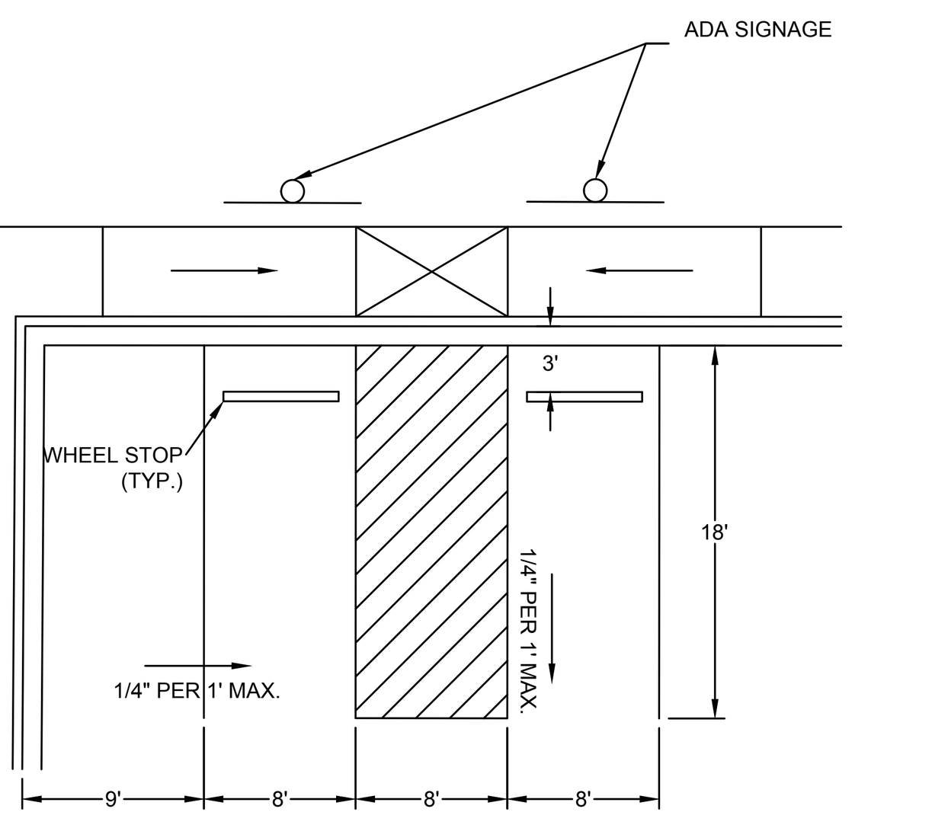
DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS
NO: DATE: DESCRIPTION:

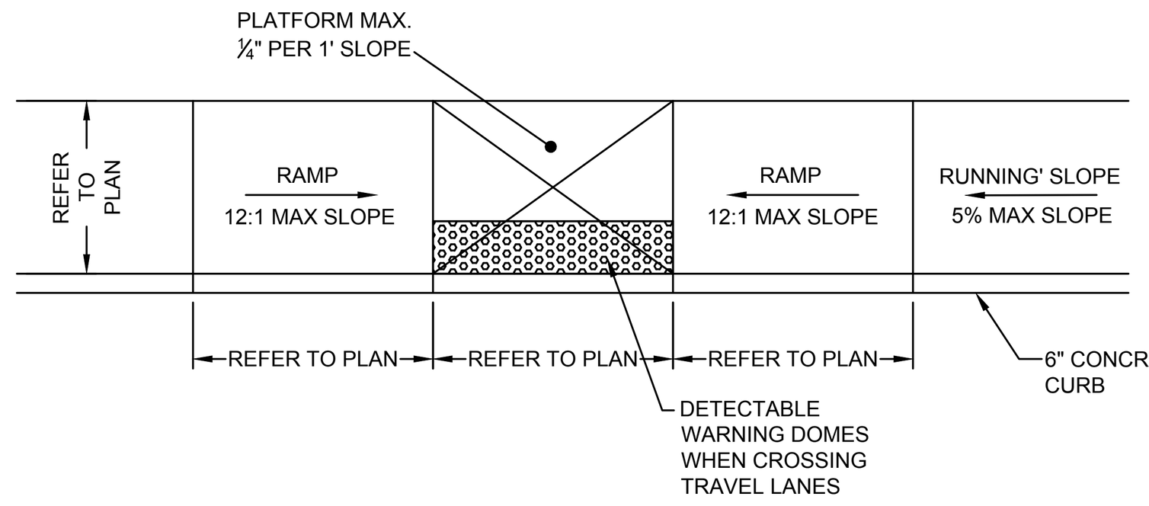
SHEET NUMBER
C400

NOTE
HANDICAP SPACES FOR PHYSICALLY HANDICAPPED PERSONS SHALL BE IDENTIFIED BY ABOVE-GRADE SIGNS STATING "RESERVED PARKING". PROVIDE ONE R7-8 SIGN AT EACH HANDICAP PARKING, AS INDICATED ON THE SITE PLAN, ON EITHER A FACING WALL OR ON A 1-1/2" DIAMETER, STEEL POST, PAINTED BLACK, AND SET IN A 12" CONCRETE FOOTING, AS SHOWN ABOVE. THE SIGN WILL BE ALUMINUM (PAINTED WHITE), WITH GREEN LETTERS AND INTERNATIONAL WHEELCHAIR SYMBOL. THE BOTTOM OF THE SIGN SHALL BE FIVE FEET ABOVE GRADE. TYPICAL ACCESSIBLE SIGNS SHALL CONFORM TO THE NORTH CAROLINA ACCESSIBILITY CODE.

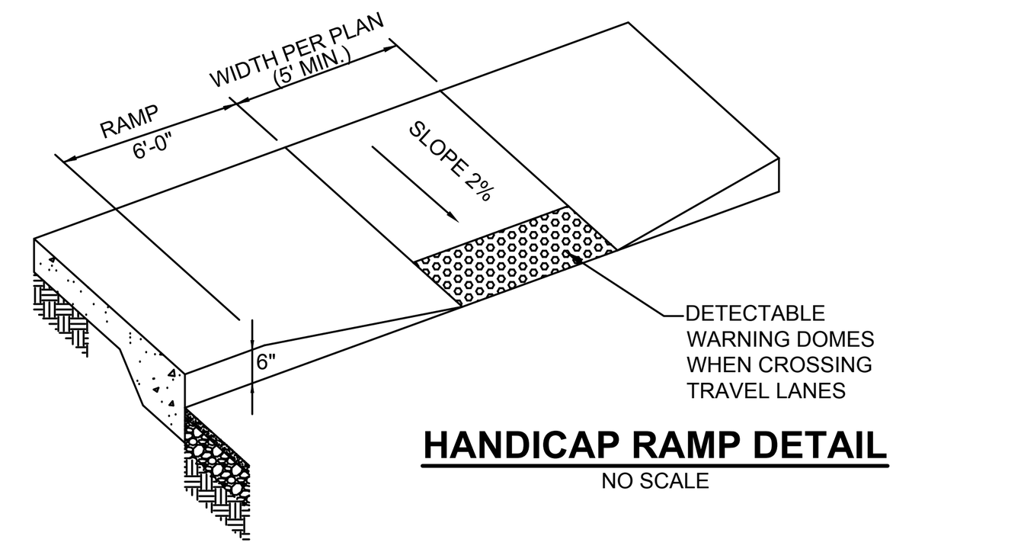
HANDICAP RAMP DETAIL (SECTION)
NO SCALE



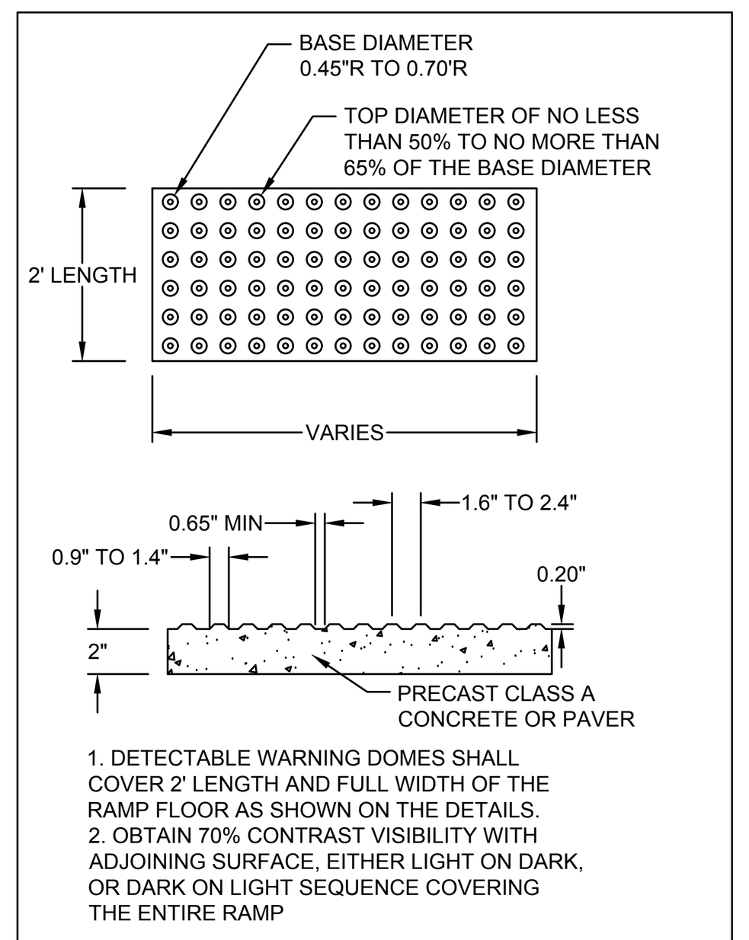
HANDICAP PARKING DETAIL
NO SCALE



HANDICAP RAMP DETAIL (PLAN)
NO SCALE

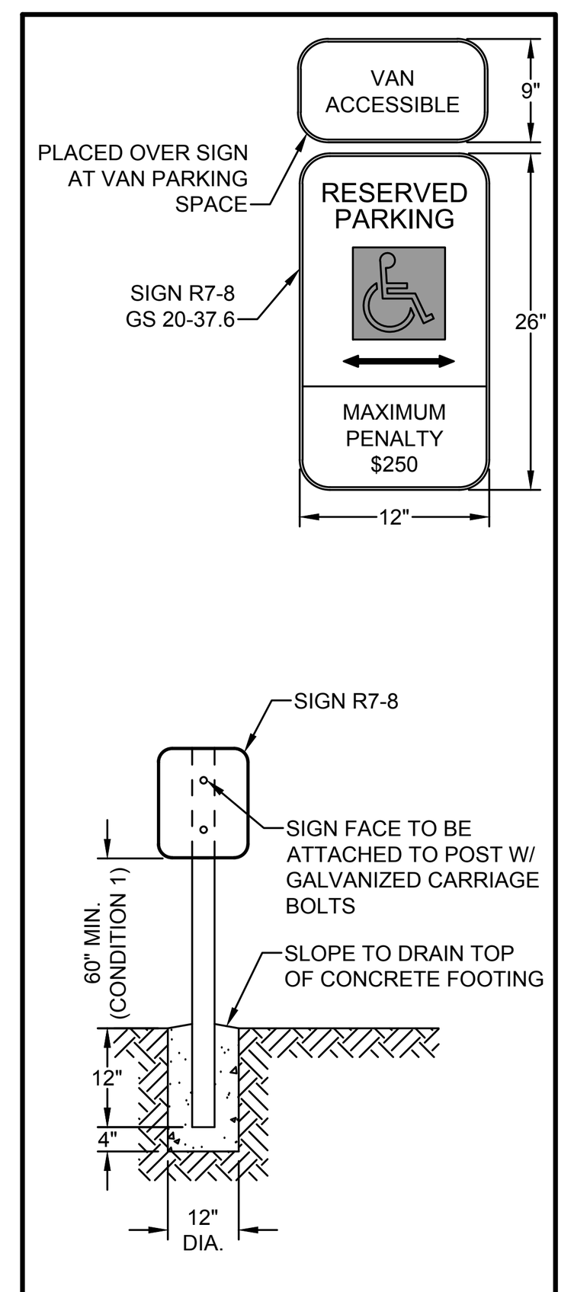


HANDICAP RAMP DETAIL
NO SCALE

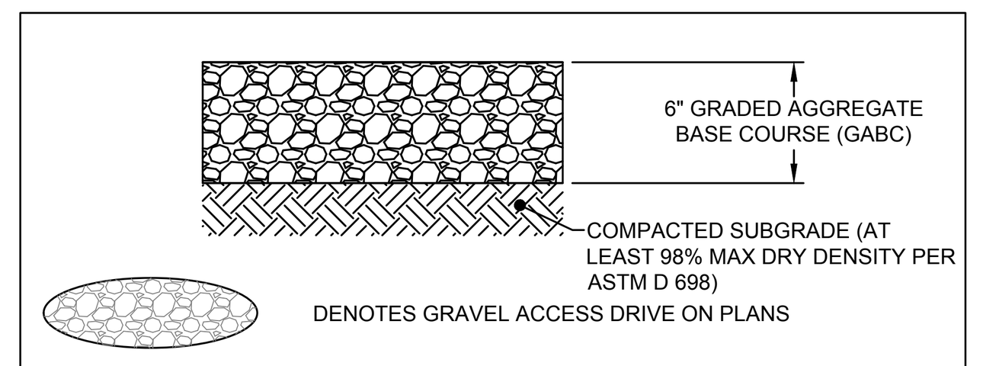


1. DETECTABLE WARNING DOMES SHALL COVER 2' LENGTH AND FULL WIDTH OF THE RAMP FLOOR AS SHOWN ON THE DETAILS.
2. OBTAIN 70% CONTRAST VISIBILITY WITH ADJOINING SURFACE, EITHER LIGHT ON DARK, OR DARK ON LIGHT SPECTRUM COVERING THE ENTIRE RAMP

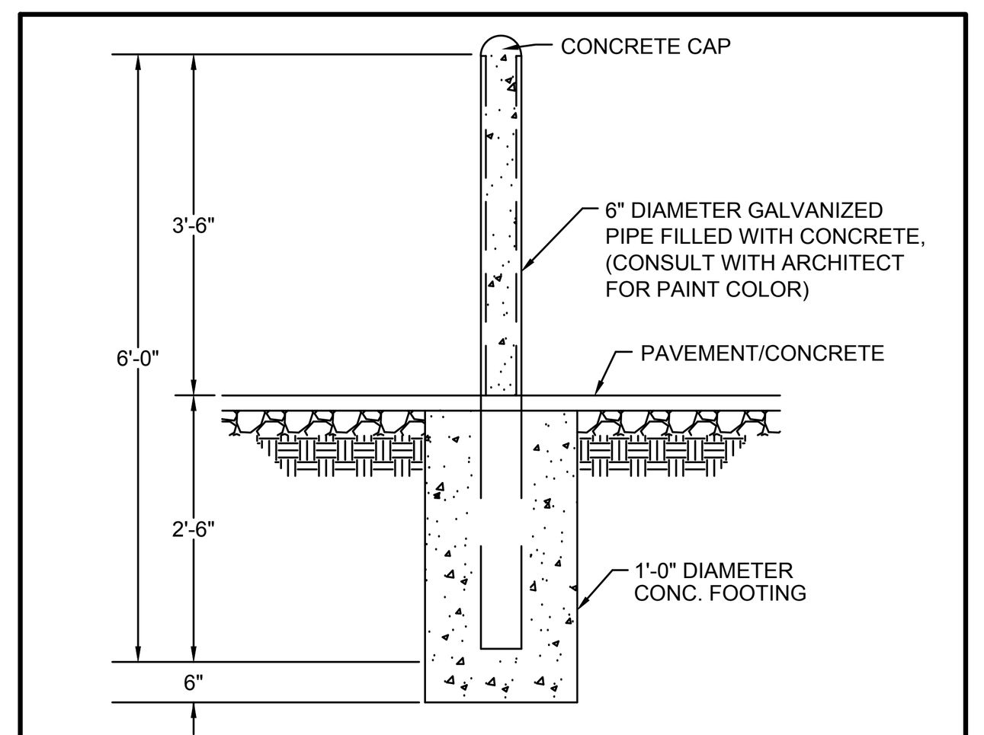
DETECTABLE WARNING DOMES
NO SCALE



HANDICAP PARKING SIGN
NO SCALE

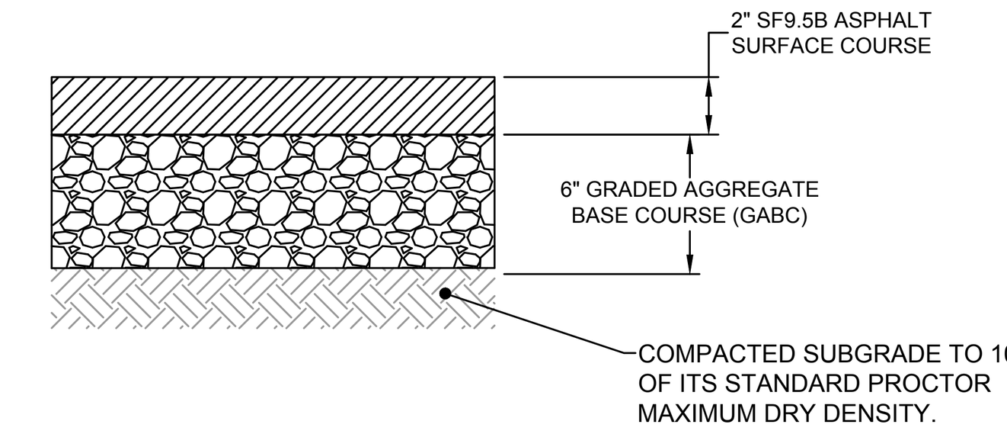


GRAVEL ACCESS ROAD
NO SCALE



BOLLARD DETAIL
NO SCALE

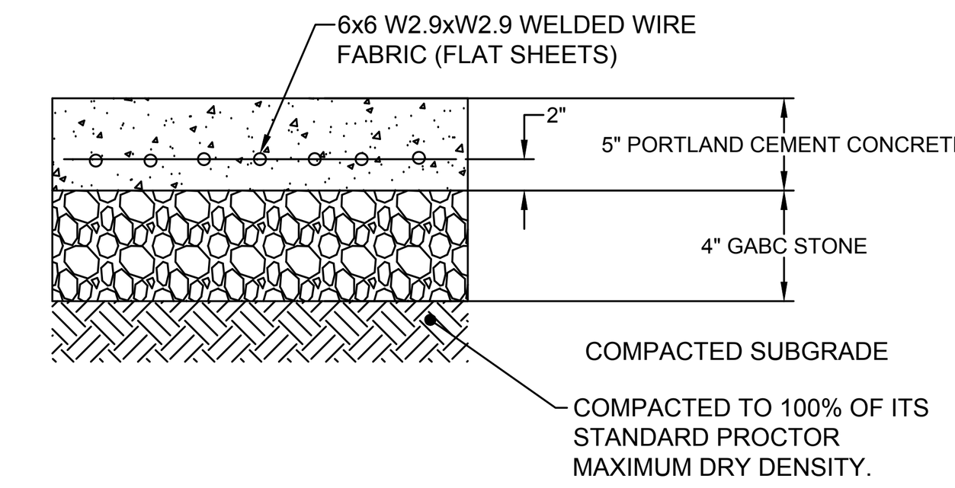
NOTE:
1. CONFIRM DESIGN CROSS SECTION WITH GEOTECHNICAL ENGINEER.
2. ABC STONE BASE COURSE TO BE COMPACTED TO 100% OF ITS STANDARD PROCTOR MAXIMUM DRY DENSITY.
3. PAVEMENT TO SUPPORT 80,000 LBS



DENOTES LIGHT DUTY ASPHALT PAVEMENT ON PLANS

LIGHT-DUTY ASPHALT PAVEMENT NTS

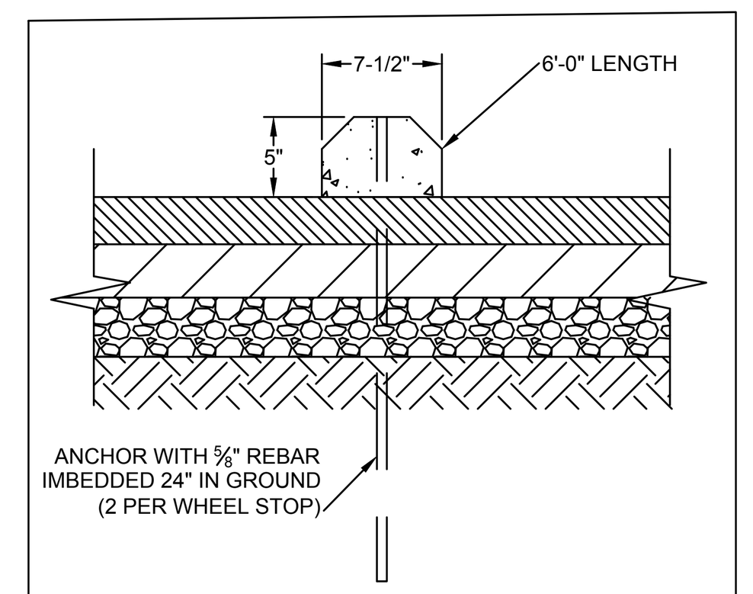
NOTES:
1. CONFIRM DESIGN CROSS SECTION WITH GEOTECHNICAL ENGINEER.
2. ABC STONE BASE COURSE TO BE COMPACTED TO 100% OF ITS STANDARD PROCTOR MAXIMUM DRY DENSITY.
3. PORTLAND CEMENT CONCRETE TO HAVE A COMPRESSIVE STRENGTH OF 4,000 PSI AT 28-DAYS AND CONTAIN 4% - 6% ENTRAINED AIR.



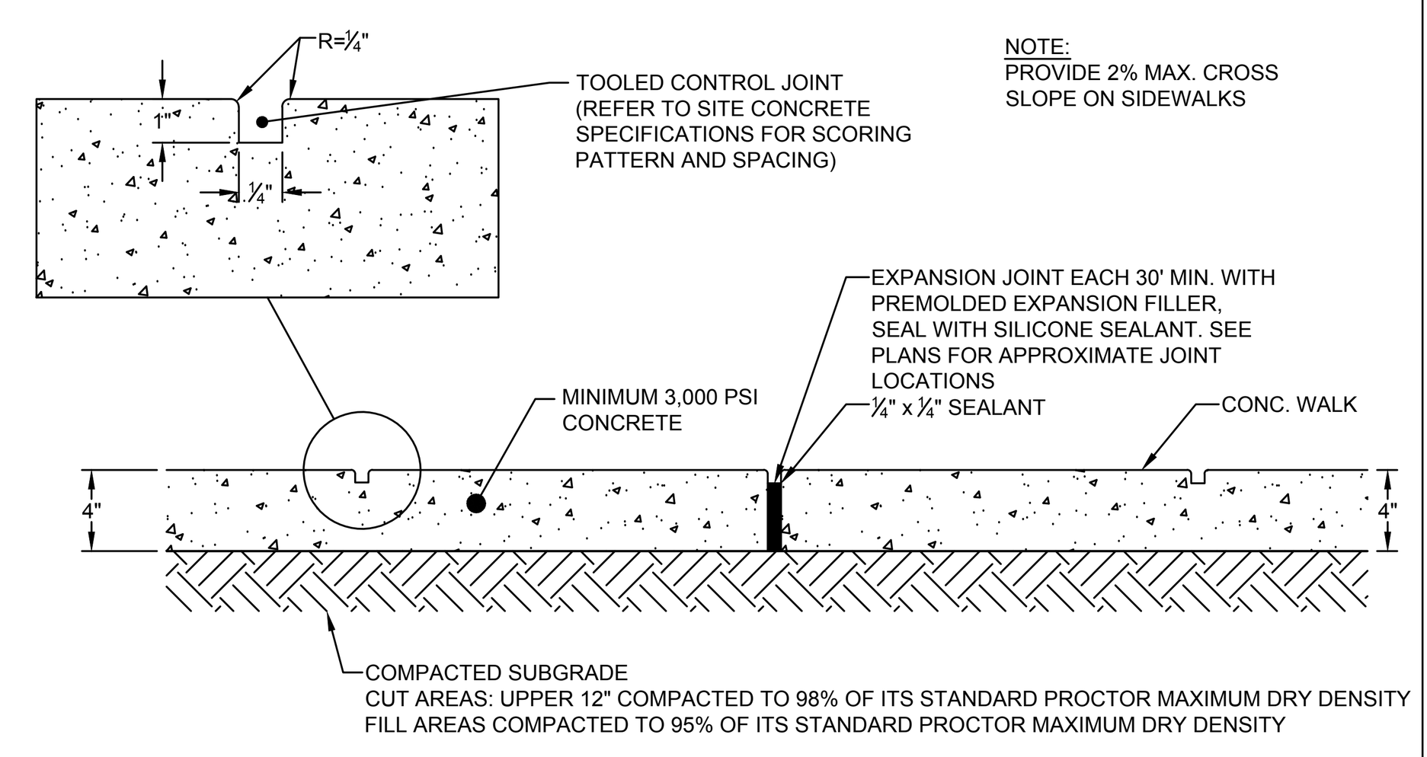
DENOTES REINFORCED CONCRETE PAVEMENT ON PLANS

HEAVY-DUTY CONCRETE PAVEMENT NTS

PAVEMENT SECTIONS BASED ON RECOMMENDATIONS LISTED IN GEOTECHNICAL REPORT BY ECS SOUTHEAST, LLP DATED OCTOBER 4, 2023



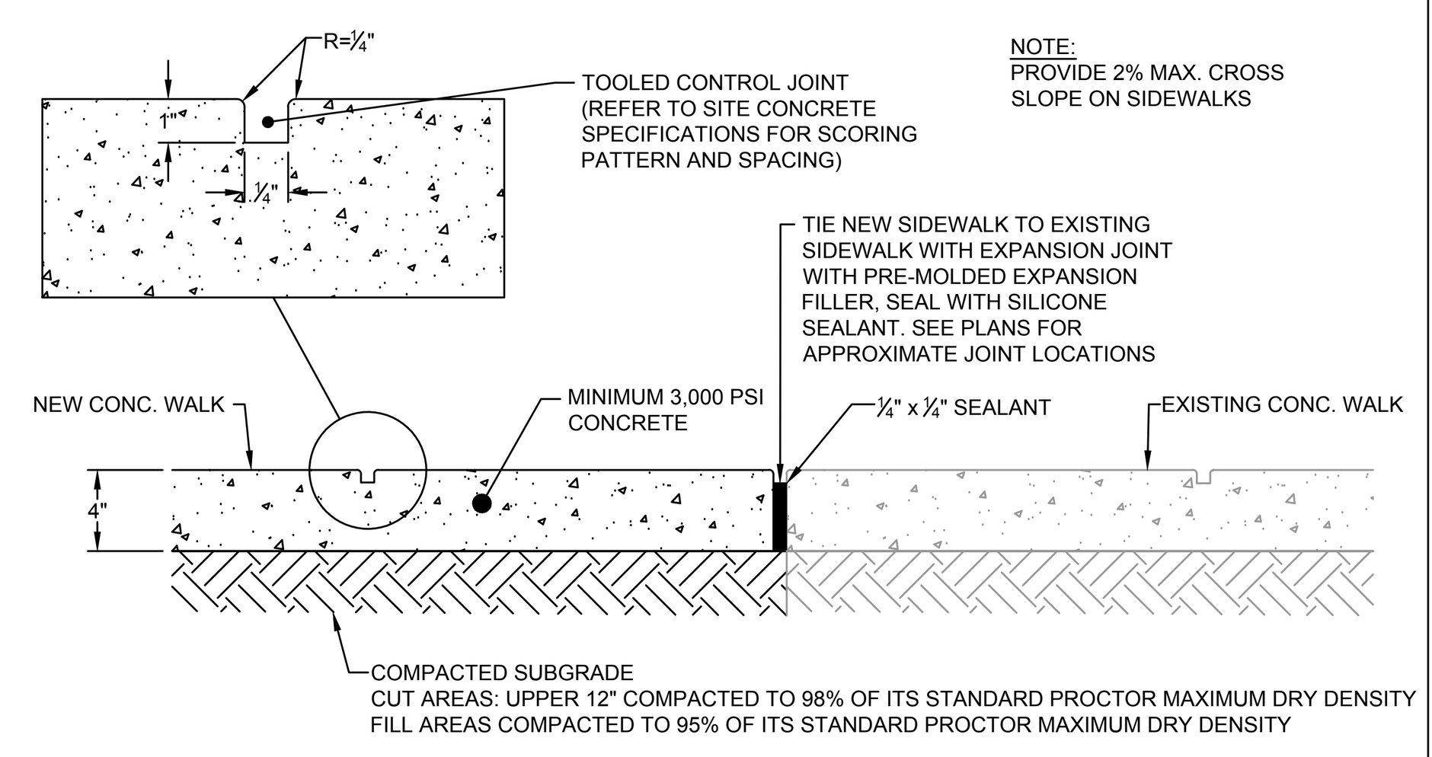
PRECAST BUMPER BLOCK (WHEEL STOP)
NO SCALE



NOTE:
PROVIDE 2% MAX. CROSS SLOPE ON SIDEWALKS

DENOTES CONCRETE SIDEWALK ON PLANS

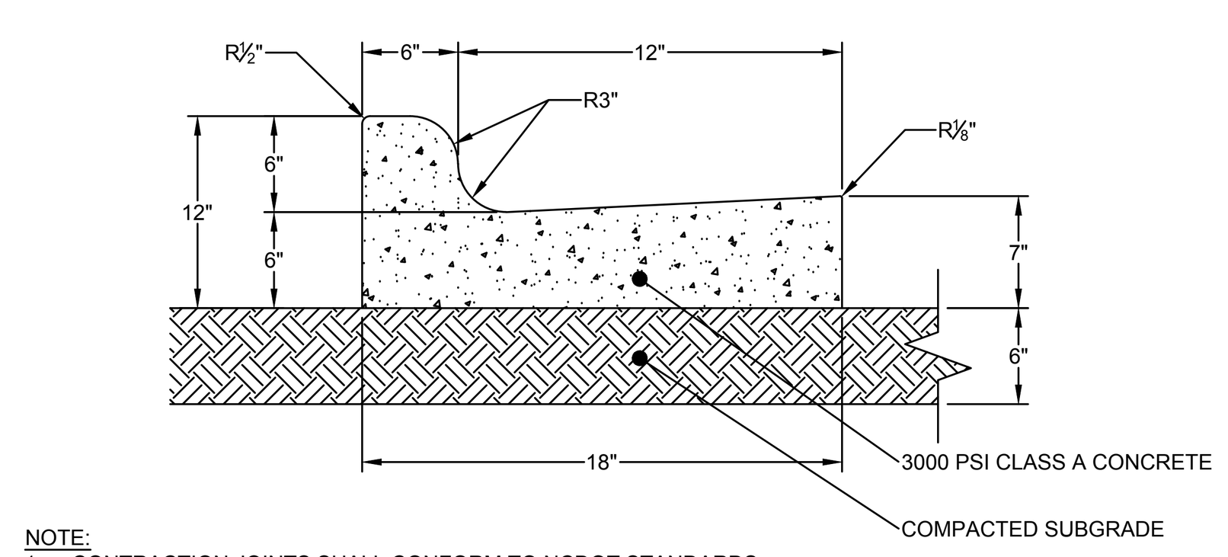
CONCRETE SIDEWALKS
NO SCALE



NOTE:
PROVIDE 2% MAX. CROSS SLOPE ON SIDEWALKS

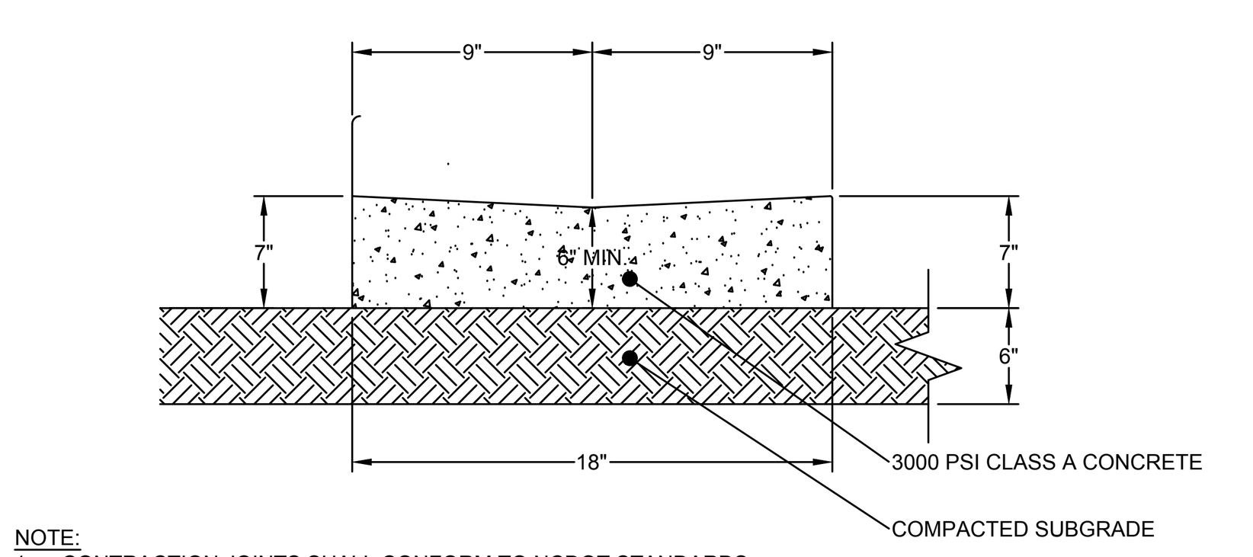
DENOTES NEW CONCRETE SIDEWALK
DENOTES EXISTING CONCRETE SIDEWALK

CONCRETE SIDEWALKS TRANSITION
NO SCALE



NOTE:
1. CONTRACTION JOINTS SHALL CONFORM TO NCDOT STANDARDS

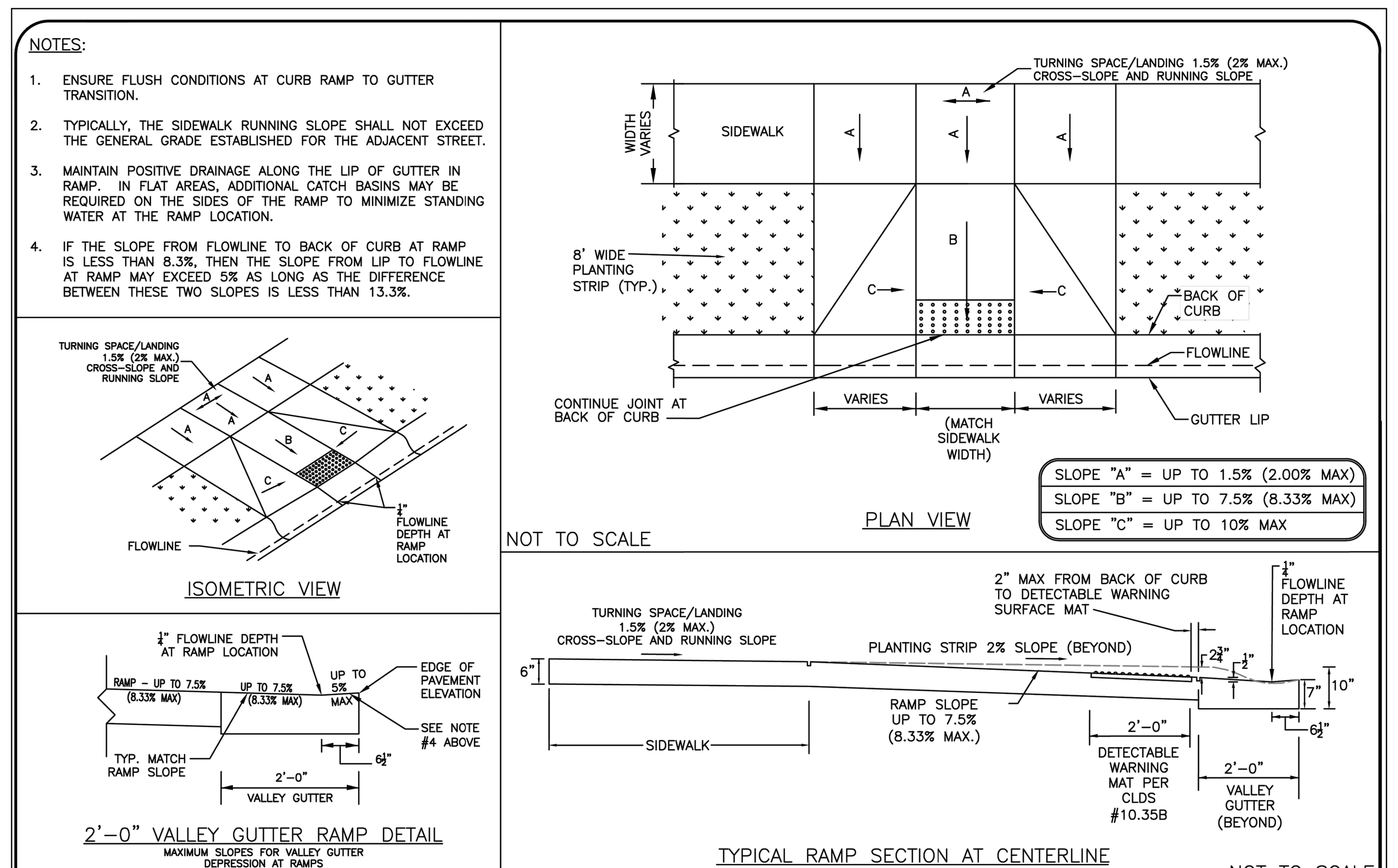
18" CURB & GUTTER
NO SCALE



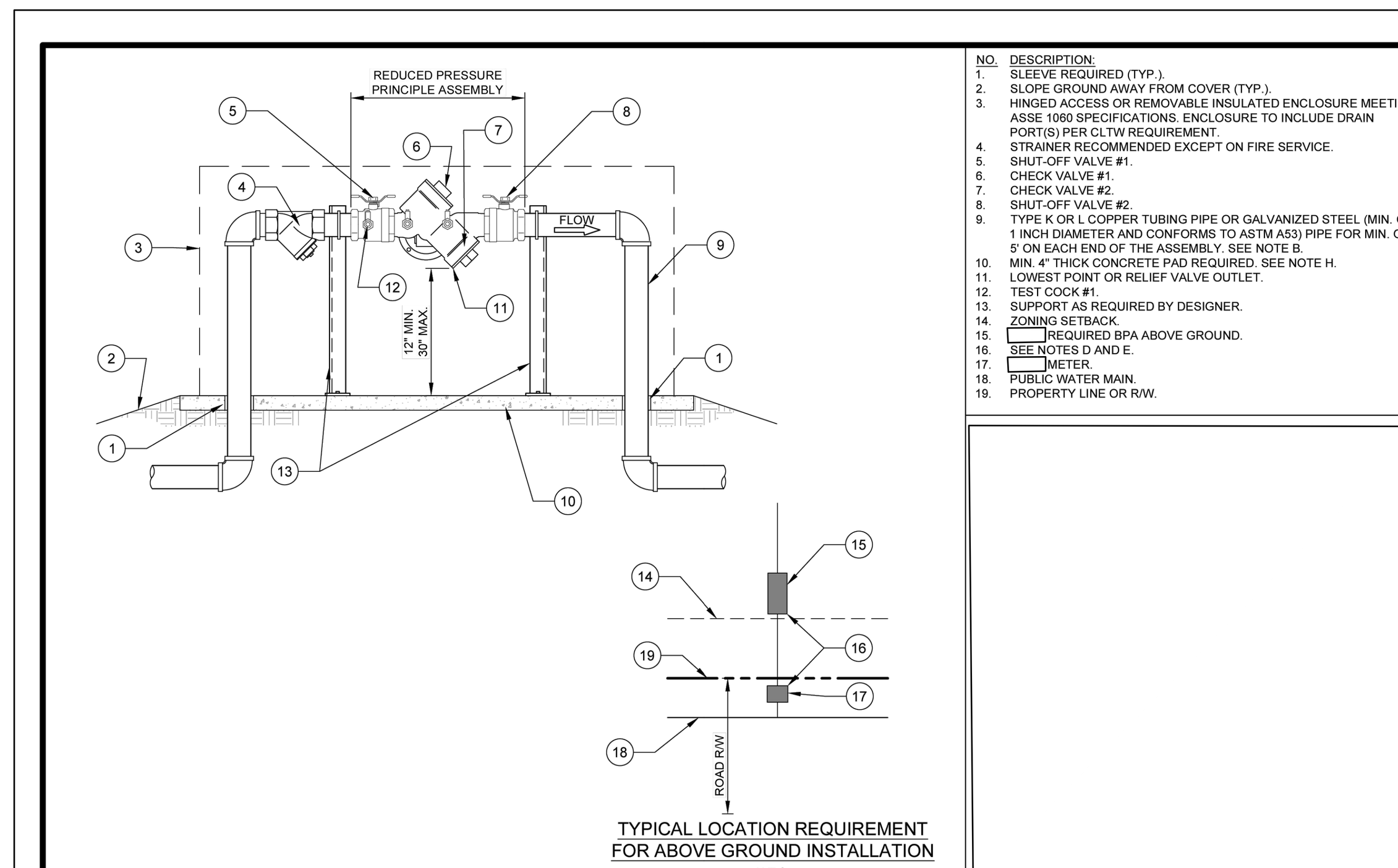
NOTE:
1. CONTRACTION JOINTS SHALL CONFORM TO NCDOT STANDARDS

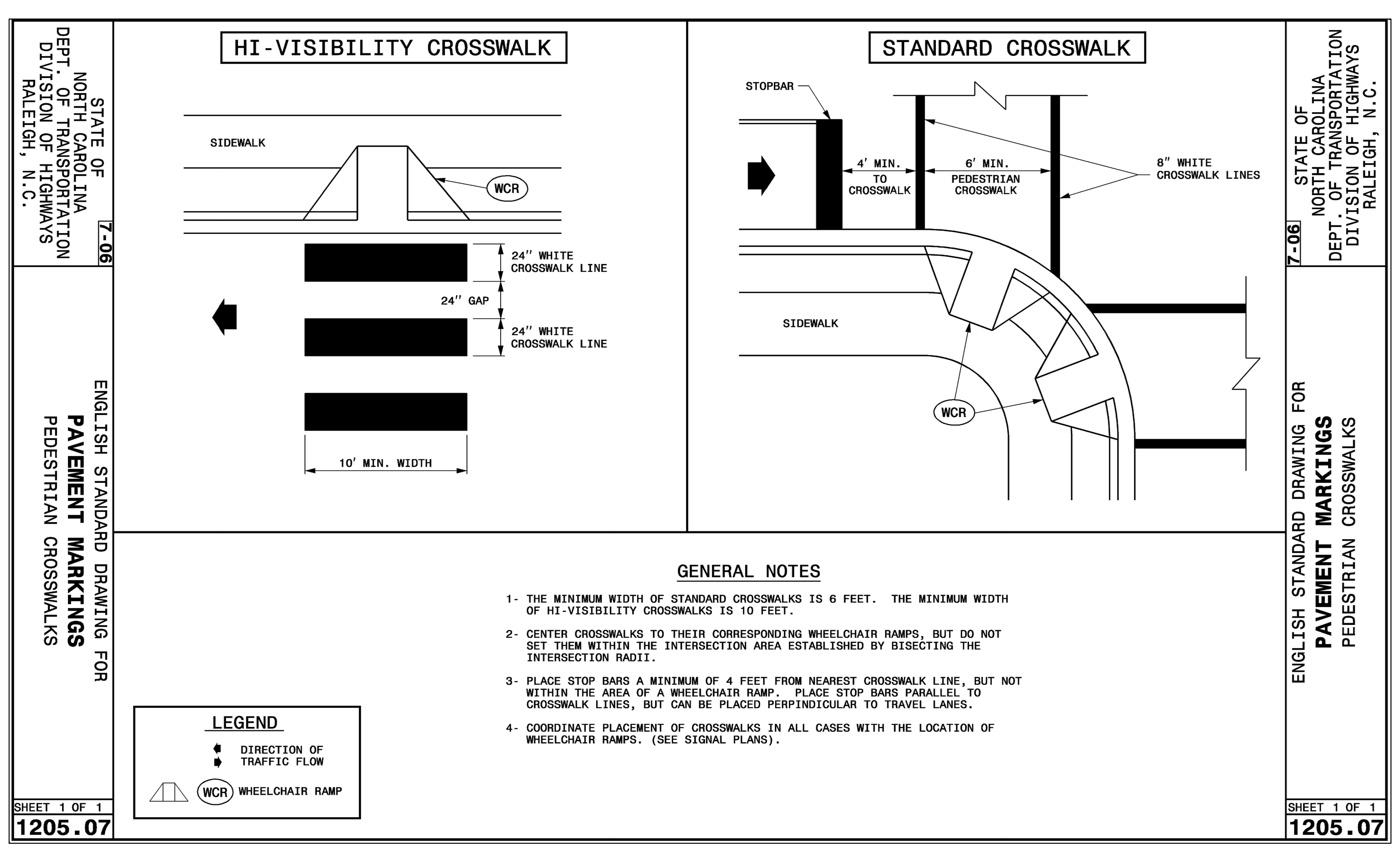
18" VALLEY CURB
NO SCALE

NOTES:
1. ENSURE FLUSH CONDITIONS AT CURB RAMP TO GUTTER TRANSITION.
2. TYPICALLY, THE SIDEWALK RUNNING SLOPE SHALL NOT EXCEED THE GENERAL GRADE ESTABLISHED FOR THE ADJACENT STREET.
3. MAINTAIN POSITIVE DRAINAGE ALONG THE LIP OF GUTTER IN RAMP. IN FLAT AREAS, ADDITIONAL CATCH BASINS MAY BE REQUIRED ON THE SIDES OF THE RAMP TO MINIMIZE STANDING WATER AT THE RAMP LOCATION.
4. IF THE SLOPE FROM FLOWLINE TO BACK OF CURB AT RAMP IS LESS THAN 8.3%, THEN THE SLOPE FROM LIP TO FLOWLINE AT RAMP MAY EXCEED 5% AS LONG AS THE DIFFERENCE BETWEEN THESE TWO SLOPES IS LESS THAN 13.3%.



VALLEY GUTTER CURB RAMP (APPLY TO 18" VALLEY CURB) NTS





GENERAL NOTES

1- THE MINIMUM WIDTH OF STANDARD CROSSWALKS IS 6 FEET. THE MINIMUM WIDTH OF HI-VISIBILITY CROSSWALKS IS 10 FEET.
2- CENTER CROSSWALKS TO THEIR CORRESPONDING WHEELCHAIR RAMPS, BUT DO NOT SET THEM WITHIN THE INTERSECTION AREA ESTABLISHED BY BISECTING THE INTERSECTION RADII.
3- PLACE STOP BARS A MINIMUM OF 4 FEET FROM NEAREST CROSSWALK LINE, BUT NOT WITHIN THE AREA OF A WHEELCHAIR RAMP. PLACE STOP BARS PARALLEL TO CROSSWALK LINES, BUT CAN BE PLACED PERPINDICULAR TO TRAVEL LANES.
4- COORDINATE PLACEMENT OF CROSSWALKS IN ALL CASES WITH THE LOCATION OF WHEELCHAIR RAMPS. (SEE SIGNAL PLANS).

LEGEND
DIRECTION OF TRAFFIC FLOW
(WCR) WHEELCHAIR RAMP

FOR LATE WINTER AND EARLY SPRING: SEEDING MIXTURE: RYE (GRAIN) – 120 LB/ACRE ANNUAL LESPEDEZA (KOBE) – 50 LB/ACRE (OMIT ANNUAL LESPEDEZA WHEN DURATION OF TEMPORARY COVER IS NOT TO EXTEND BEYOND JUNE) SEEDING DATES: JAN. 1 – MAY 1	SOIL AMENDMENTS: FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10–10–10 FERTILIZER MULCH: APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL MAINTENANCE: REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE
FOR SUMMER: SEEDING MIXTURE: GERMAN MILLET – 40 LB/ACRE (A SMALL–STEMMED SUDANGRASS MAY BE SUBSTITUTED AT A RATE OF 50 LB/ACRE) SEEDING DATES: MAY 1 – AUG. 15	SOIL AMENDMENTS: FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 750 LB/ACRE 10–10–10 FERTILIZER MULCH: APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL MAINTENANCE: REFERTILIZE IF GROWTH IS NOT FULLY ADEQUATE. RESEED, FERTILIZE AND MULCH IMMEDIATELY FOLLOWING EROSION OR OTHER DAMAGE
FOR FALL: SEEDING MIXTURE: RYE (GRAIN) – 120 LB/ACRE SEEDING DATES: AUG. 15 – DEC 30	SOIL AMENDMENTS: FOLLOW RECOMMENDATIONS OF SOIL TESTS OR APPLY 2,000 LB/ACRE GROUND AGRICULTURAL LIMESTONE AND 1,000 LB/ACRE 10–10–10 FERTILIZER MULCH: APPLY 4,000 LB/ACRE STRAW. ANCHOR STRAW BY TACKING WITH ASPHALT, NETTING, OR A MULCH ANCHORING TOOL. A DISK WITH BLADES SET NEARLY STRAIGHT CAN BE USED AS A MULCH ANCHORING TOOL MAINTENANCE: REPAIR AND REFERTILIZE DAMAGED AREAS IMMEDIATELY. TOPDRESS WITH 50 LB/ACRE OF NITROGEN IN MARCH. IF IT IS NECESSARY TO EXTEND TEMPORARY COVER BEYOND JUNE 15, OVERSEED WITH 50 LB/ACRE KOBE LESPEDEZA IN LATE FEBRUARY OR EARLY MARCH.

FOR ADDITIONAL INFORMATION, REFER TO NCDENR EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL (ESCPDM), SECTION 6.10.
FOR PERMANENT SEEDING SPECIFICATIONS, INCLUDING SEED BED PREP, SEASONAL LIMITATIONS FOR SEEDING OPERATIONS, THE KINDS OF GRADES OF FERTILIZERS, THE KINDS OF SEED, AND THE RATES OF APPLICATION OF LIMESTONE, FERTILIZER, AND SEED, REFER TO NCDENR ESCPDM SECTION 6.11 AND THE CHARLOTTE LANDSCAPE CONSTRUCTION STANDARDS SECTION 04200 SEEDING AND SODDING OF TURFGRASS.

TEMPORARY SEEDING SCHEDULE

Date: Page:

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR LATE WINTER AND EARLY SPRING

SEEDING MIXTURE

Species	Rate
Centipede	5 lbs/acre
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Coastal or Eastern Piedmont for Centipede- Sept. 1 - May 1
Coastal and Piedmont for Indian Woodoats and Virginia Wild Rye- Feb 15 - April 1
Mountains for Indian Woodoats and Virginia Wild Rye- March 1 - May 15

Maintenance:
Significant maintenance may be required to obtain desired cover once centipede is planted. Acceptable for sodding.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR SUMMER

SEEDING MIXTURE

Species	Rate
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - July 15- Aug 15
Piedmont - Aug 15 - Oct 15

Maintenance:
Indian Woodoats and Virginia Wild Rye are both sun and shade tolerant.

NON-INVASIVE PERMANENT SEEDING RECOMMENDATIONS FOR FALL

SEEDING MIXTURE

Species	Rate
Hard Fescue	15 lbs/acre
Switchgrass	2.5-3.5 lbs/acre*
Indian Grass	5-7 lbs/acre*
Big Bluestem	5-7 lbs/acre*
Indian Woodoats	1.5-2.5 lbs/acre*
Virginia Wild Rye	4-6 lbs/acre*

*Depending upon mix with other species. See table 6.11.d from Chapter 6 of the NC Erosion and Sediment Control Planning and Design Manual.

Seeding Dates
Mountains - Hard Fescue- Aug 1 - June 1
Mountains- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 15
Piedmont and Coastal- Switchgrass, Indian Grass, Big Bluestem- Dec 1 - April 1
Coastal- Indian Woodoats and Virginia Wild Rye- Sept 1 - Nov 1

Maintenance:
Hard Fescue is not recommended for slopes > 5%. Prefers shade.

SEED BED PREPARATION:

LIMING- Apply lime according to soil test recommendations. If the pH (acidity) of the soil is not known, an application of ground agricultural limestone at the rate of 1 to 1 ½ tons/acre on coarse-textured soils and 2-3 tons/acre on fine-textured soils is usually sufficient. Apply limestone uniformly and incorporate into the top 4-6 inches of soil. Soils with a pH of 6 or higher need not be limed.
FERTILIZER- Base application rates on soil tests. When these are not possible, apply a 10-10-10 grade fertilizer at 700-1,000 lb/acre. Both fertilizer and lime should be incorporated into the top 4-6 inches of soil. If a hydraulic seeder is used, do not mix seed and fertilizer more than 30 minutes before application.
SURFACE ROUGHENING- If recent tillage operations have resulted in a loose surface additional roughening may not be required, except to break up large clods. If rainfall causes the surface to become sealed or crusted, loosen it just prior to seeding by raking, harrowing, or other suitable methods for fine grading. The finished grade shall be a smooth even soil surface with a loosen uniformly fine texture. All ridges and depressions shall be removed and filled to provide the approved surface drainage. Planting is to be done immediately after finished grades are obtained and seedbed preparation is completed.

NOTES:
1. Permanent seeding, sodding or other means of stabilization are required when all construction work is completed according to the NPDES timeframe's table.
2. A North Carolina Department of Agriculture soils test (or equal) is highly recommended to be obtained for all areas to be seeded, sprigged, sodded or planted.
3. Use a seeding mix that will produce fast growing nurse crops and includes non-invasive species that will eventually provide a permanent groundcover. Soil blankets may be used in lieu of nurse crops. Mat, tack or crimp mulch, as needed to stabilize seeded areas until root establishment. Mulch must be applied uniformly over the soil with a cover density of at least 80%.
4. Ground cover shall be maintained until permanent vegetation is established and stable against accelerated erosion.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

PERMANENT SEEDING RECOMMENDATIONS

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RCC HENDRICK CENTER FOR AUTOMOTIVE TRAINING

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SEAL 34288
BRIAN T. CRUTCH

BID DOCUMENTS

NOTES & DETAILS

DATE: 3-3-2025
PROJECT NO: 61085

REVISIONS

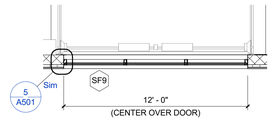
NO:	DATE:	DESCRIPTION:
1	12/16/2024	SCO COMMENTS

SHEET NUMBER

C500

GENERAL SHEET NOTES

1. ALL ARCHITECTURAL COMPONENTS ARE TO BE ATTACHED AS REQUIRED BY ASCE 7-05 CHAPTER 13 SEISMIC DESIGN FOR NONSTRUCTURAL COMPONENTS. EACH INDIVIDUAL CONTRACTOR RESPONSIBLE FOR THE COMPONENT MUST PROVIDE PROJECT SPECIFIC DESIGN AND DOCUMENTATION PREPARED BY A LICENSED ENGINEER. CHAPTER 13 DEFINES THE FORCE REQUIRED TO SUPPORT THE COMPONENT FOR THE ANCHORAGE AND BRACING. THE COST OF PREPARING THIS INFORMATION AND DESIGN SHALL BE INCLUDED IN EACH CONTRACTOR'S BID PROVIDING THE COMPONENT.
2. FIELD VERIFY ALL CONDITIONS. GENERAL CONTRACTOR MUST NOTIFY ARCHITECT OF ANY DISCREPANCIES PRIOR TO START OF WORK AFFECTED BY SUCH DISCREPANCY.
3. DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, OBTAIN CLARIFICATION FROM ARCHITECT.
4. PROVIDE BLOCKING WITHIN STUD WALLS AS REQUIRED FOR SUPPORT OF CABINETS, SHELVING, WALL STOPS, COUNTERTOPS, MARKERBOARDS, TACKBOARDS, AV EQUIPMENT AND SIMILAR.
5. PLACE CONTROL JOINTS IN SIDEWALK AND PAVING PER MINIMUM REQUIREMENTS STATED IN CIVIL DOCUMENTS. GENERAL LAYOUT TO BE COORDINATED BY G.C.
6. ALL INTERIOR DIMENSIONS ARE TO FACE OF STUD OR FACE OF MASONRY U.N.O.

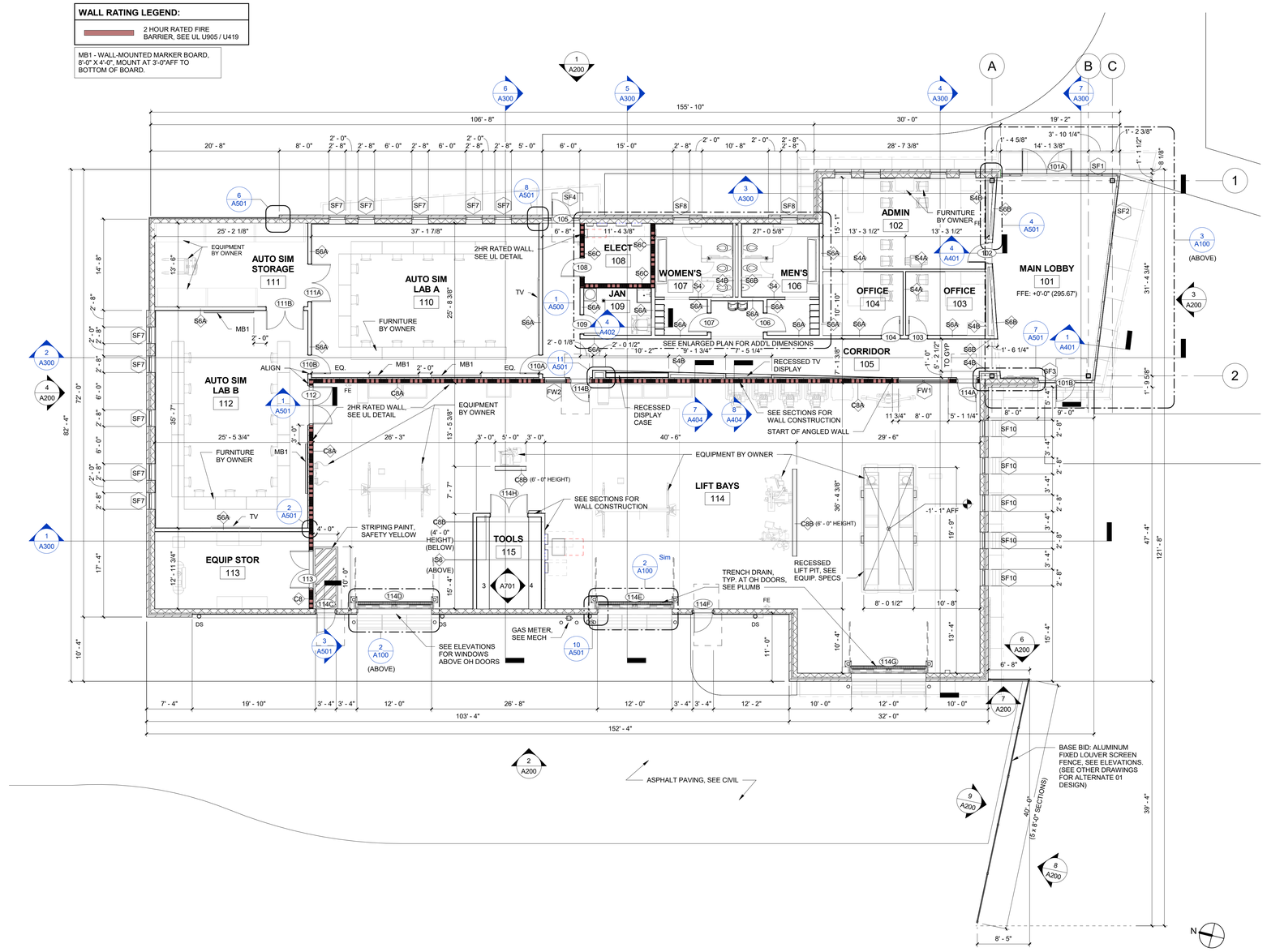


PLAN AT CLERESTORY | 1/4" = 1'-0" | 2

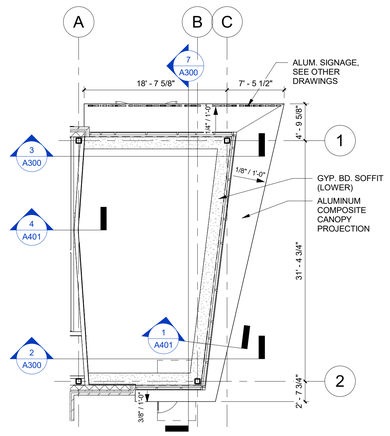
WALL RATING LEGEND:

2 HOUR RATED FIRE BARRIER, SEE UL U905 / U419

MB1 - WALL-MOUNTED MARKER BOARD, 8'-0" X 4'-0", MOUNT AT 3'-0"AFF TO BOTTOM OF BOARD.



FLOOR PLAN | 1/8" = 1'-0" | 1



UPPER LOBBY PLAN | 1/8" = 1'-0" | 3

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BID DOCUMENTS

FLOOR PLAN

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

GILMORE 3434 NORTH CAROLINA CHARLOTTE, N.C.
ADW ARCHITECTS, P.A. CORPORATE SEAL 50223 NORTH CAROLINA
3-3-2025

SHEET NUMBER

A100

ROOF GENERAL NOTES

1. ALL DIMENSIONS TO BE FIELD VERIFIED. DO NOT SCALE DRAWINGS. IF DIMENSIONS ARE IN QUESTION, OBTAIN CLARIFICATION FROM ARCHITECT.
2. COORDINATE EXHAUST FAN AND MECHANICAL UNIT LOCATIONS WITH MECHANICAL AND ELECTRICAL CONTRACTORS.
3. SEE PLUMBING DRAWINGS FOR LOCATIONS OF ALL PLUMBING VENTS AND GAS PIPING (COORDINATE WITH ALL TRADES)
4. COORDINATE ALL PENETRATIONS THROUGH ROOF W/ STRUCTURAL, PLUMBING, MECHANICAL, AND ELECTRICAL. PROVIDE ALL FLASHING AT PENETRATIONS PER SMACNA DETAILS UNLESS OTHERWISE NOTED.
5. ROOF CURBS FOR ALL MECHANICAL UNITS AND EQUIPMENT TO BE FURNISHED BY M.C. AND INSTALLED AND FLASHED BY G.C. UNLESS OTHERWISE NOTED.
6. G.C. TO COORDINATE, LOCATE, AND INSTALL DRAINS AND CURBS. ROOFING CONTRACTOR SHALL FLASH AND SEAL ALL DRAINS, ROOF PENETRATIONS, ROOF EDGES, AND TERMINATIONS AS PART OF THIS CONTRACT, INCLUSIVE OF WARRANTY AS LISTED IN THE PROJECT MANUAL.
7. ROOF PLAN AND DETAILS ARE FOR GENERAL DESIGN INTENT. G.C. TO SUBMIT COMPLETE SHOP DRAWINGS SHOWING ALL CONSTRUCTION DETAILS AND LAYOUTS FOR A COMPLETE JOB ADHERING TO MANUFACTURERS' WARRANTIES.
8. PROVIDE ALL TAPERS AND CRICKETS FOR PROPER DRAINAGE.
9. SLOPE ALL ROOF AREAS AT A MIN. OF 1/4" PER FOOT UNLESS OTHERWISE NOTED.
10. ALL CONCEALED WOOD BLOCKING SHALL BE P.T. SECURE TO DECKING AND SUBSTRATE WITH ANCHOR BOLTS.
11. UNLESS OTHERWISE NOTED, PRIME & PAINT ALL EXPOSED STEEL MEMBERS W/ EXTERIOR GRADE HIGH PERFORMANCE COATINGS. SEE SPECIFICATIONS.
12. UTILIZE METAL WALL FLASHING AND COUNTER FLASHING ON BACKSIDE OF ALL PARAPETS WITH A HEIGHT OF 2'-0" OR GREATER.
13. ALL SHEET METAL APPLICATIONS SHALL BE INSTALLED PER NRCA's "THE ROOFING MANUAL" AND SMACNA's "ARCHITECTURAL SHEET METAL MANUAL" SEVENTH EDITION APPROVED DETAILING, INCLUDING (BUT NOT LIMITED TO) COPING, STEP-FLASHING, METAL WALL FLASHING, ROOF PENETRATION FLASHING, STANDING SEAM METAL ROOFS, GUTTERS, SCUPPERS, GUTTER STOPS, CONDUCTOR HEADS, AND MISC. JOINTS BETWEEN SHEET METAL MEMBERS.
14. ALL RIGID INSULATION USED IN ROOF ASSEMBLIES SHALL MEET THE REQUIREMENTS OF UL 1256 AND FMG 4450.
15. ROOF ACCESS LADDERS SHALL MEET OSHA AND BUILDING CODE REQUIREMENTS.
16. METAL GAUGES SHALL COMPLY WITH ANSI/SPRI ES-1 REQUIREMENTS FOR SHOP FORMED METAL COPINGS.
17. ALL WOOD MEMBERS SHALL BE PRESERVATIVE TREATED.
18. ALL MECHANICAL EQUIPMENT & EXHAUST FANS SHALL BE ON ROOF CURBS. ALL ROOF CURBS SHALL BE INSULATED AND THE VOID BENEATH ITEMS WITHIN THE CURB SPACE SHALL BE FILLED WITH INSULATION.
19. ALL CRICKETS ARE ANGLED 30 DEGREES MIN, UNLESS NOTED OTHERWISE.
20. ALL CRICKET SLOPES ARE 1/4" PER 1'-0" UNLESS NOTED OTHERWISE.
21. ALL OBJECTS GREATER THAN 24" IN WIDTH ACROSS SLOPE SHALL HAVE CRICKETS TO DIVERT WATER AROUND THEM.
22. ANYWHERE EXPOSED FASTENERS ARE USED IN THE ROOFING SYSTEM, COPING SYSTEM, EXPANSION JOINT SYSTEM, OR FLASHING SYSTEM, THEY SHALL UTILIZE SEALING WASHERS.

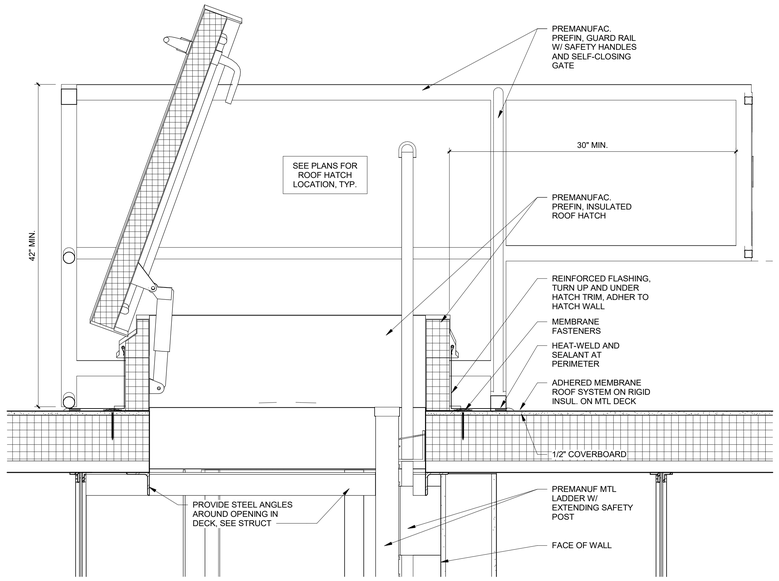
ROOF DRAINAGE CALCULATIONS:

ROOF DRAINAGE:

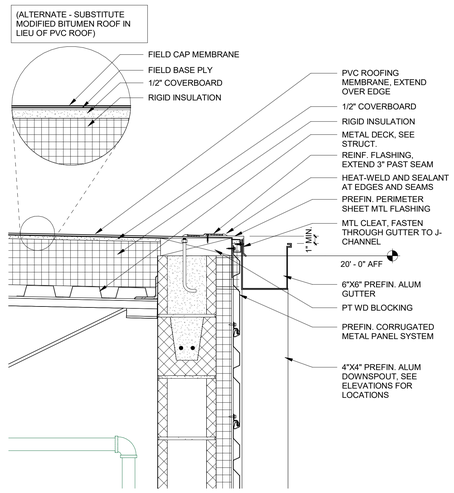
PRIMARY ROOF AREA
9,363 SF (ROOF) + 832 SF (PARAPET) = 10,195 SF
ROOF AREA/4 = 2,548 SF PER DOWNSPOUT

HORIZONTAL GUTTER: 6"X6"

NCPC FIGURE 1106.1(a) FOR 100 YR 60 MINUTE PRECIPITATION (4.0"):
FOUR (4) 2 3/4" x 4 1/4" DOWNSPOUTS REQUIRED PER TABLE 1106.2(2)
FOUR (4) 6" x 6" DOWNSPOUTS PROVIDED

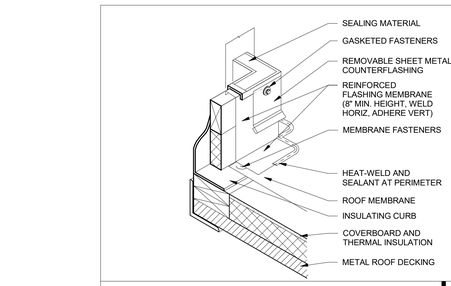


ROOF HATCH AND RAIL DETAIL | 1 1/2" = 1'-0" | 3

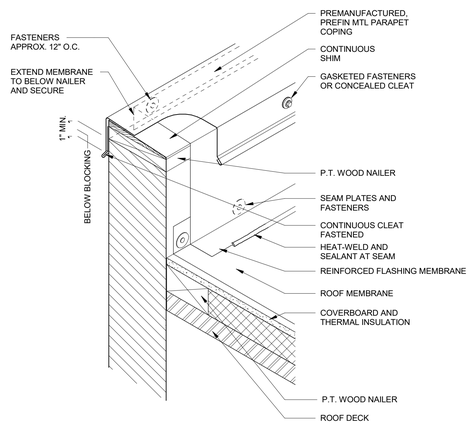


REF:1/A403

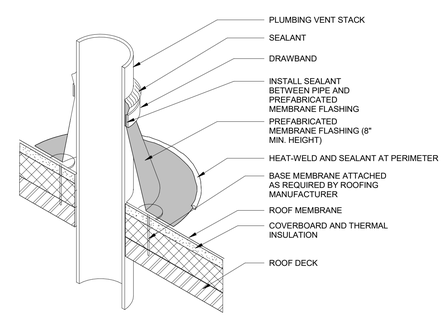
ROOF DETAIL @ GUTTER | 1 1/2" = 1'-0" | 2



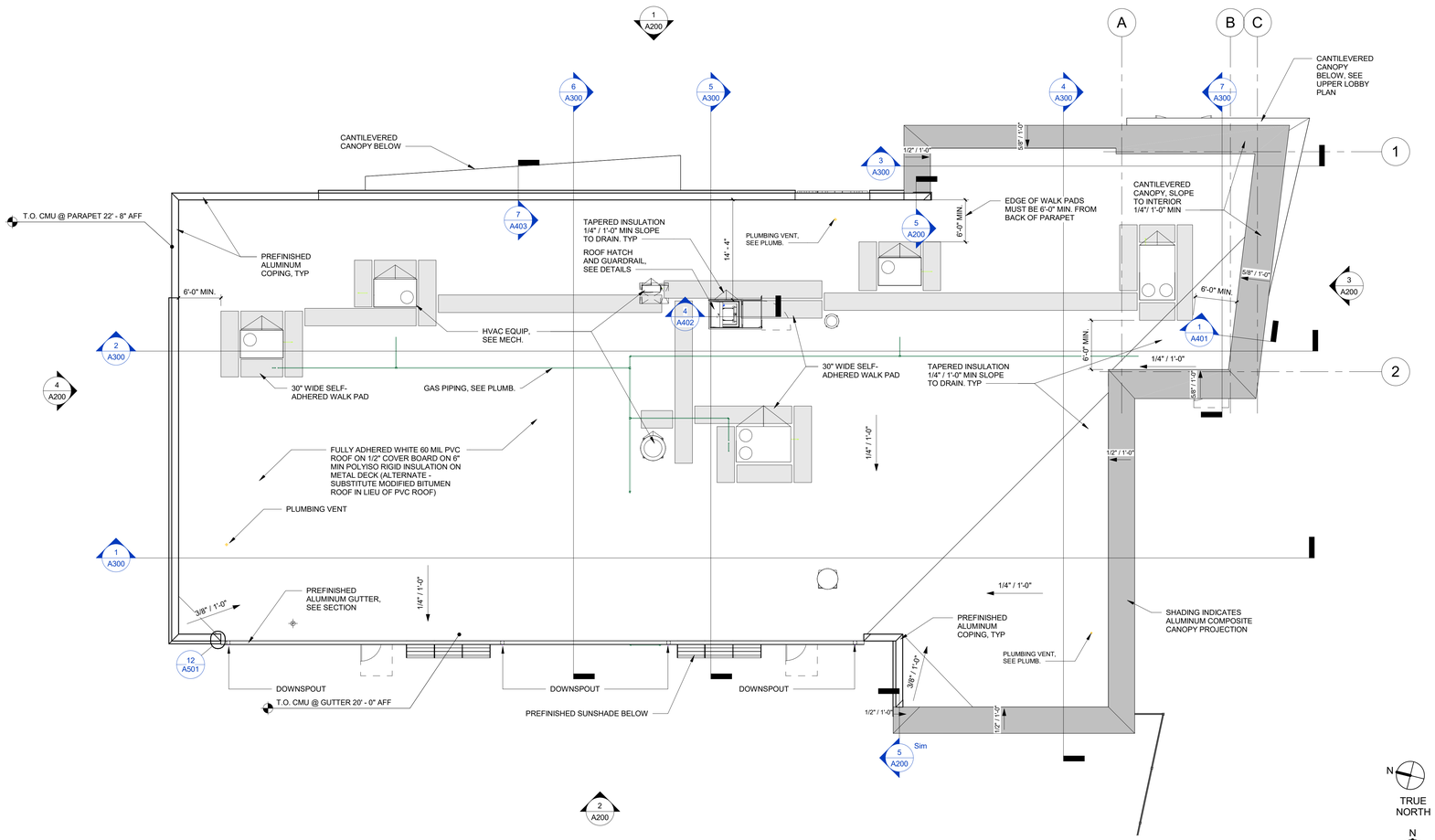
MECH. CURB - ISOMETRIC | 3" = 1'-0" | 4



ROOF PARAPET FLASHING | 3" = 1'-0" | 6



ROOF VENT PIPE - ISOMETRIC | 3" = 1'-0" | 5



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

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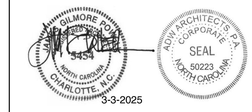
BID DOCUMENTS

ROOF PLAN

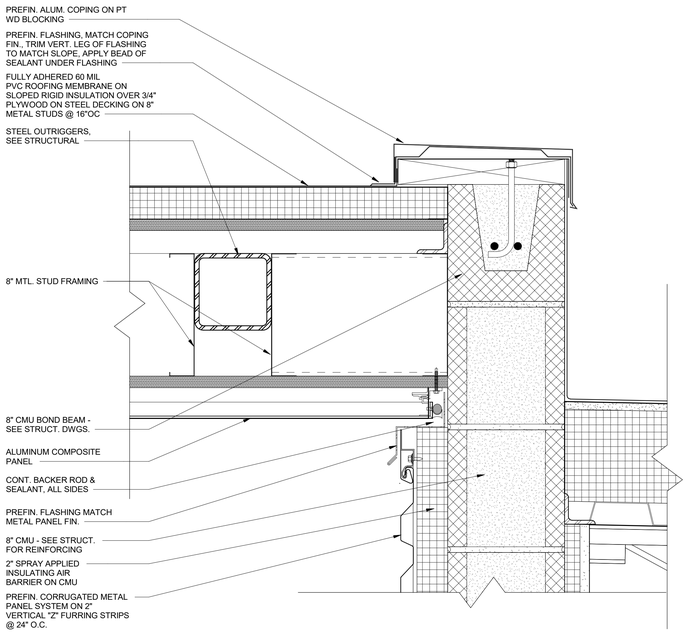
DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

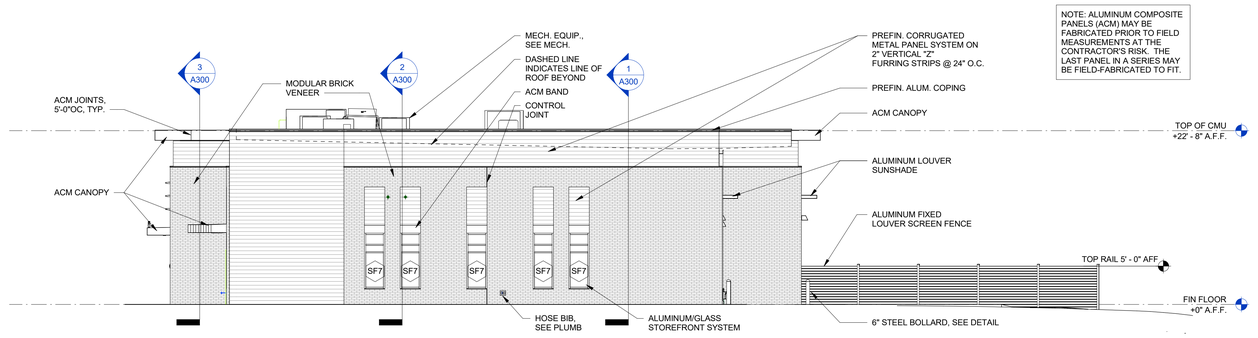


SHEET NUMBER

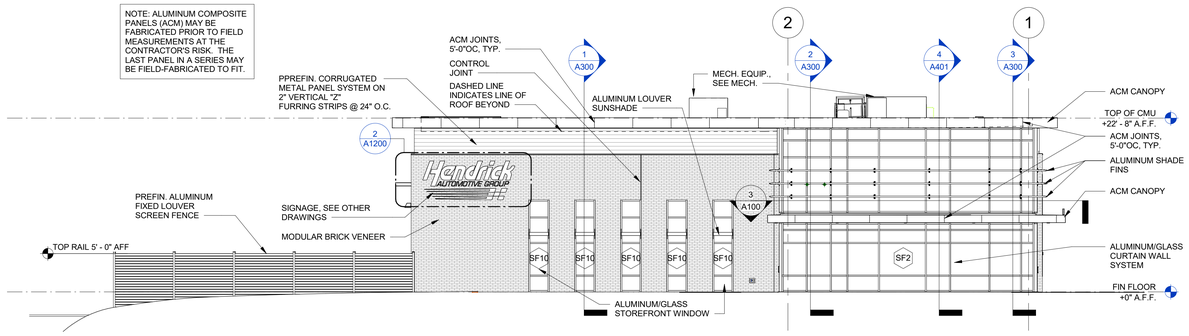
A110



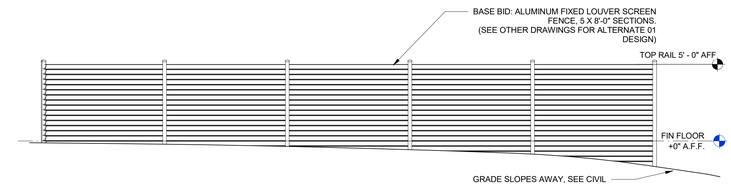
SECTION DETAIL AT ACM/PARAPET 3" = 1'-0" 5



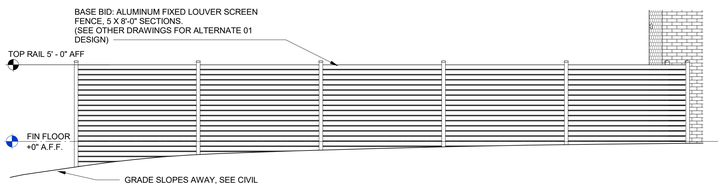
WEST ELEVATION 1/8" = 1'-0" 4



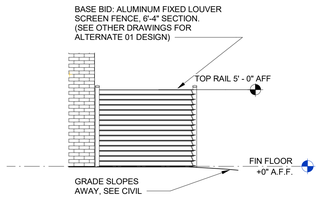
EAST ELEVATION 1/8" = 1'-0" 3



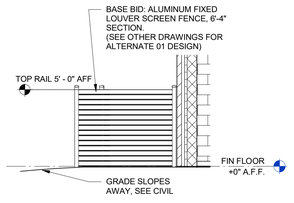
SCREEN FENCE - WEST ELEVATION 1/4" = 1'-0" 9



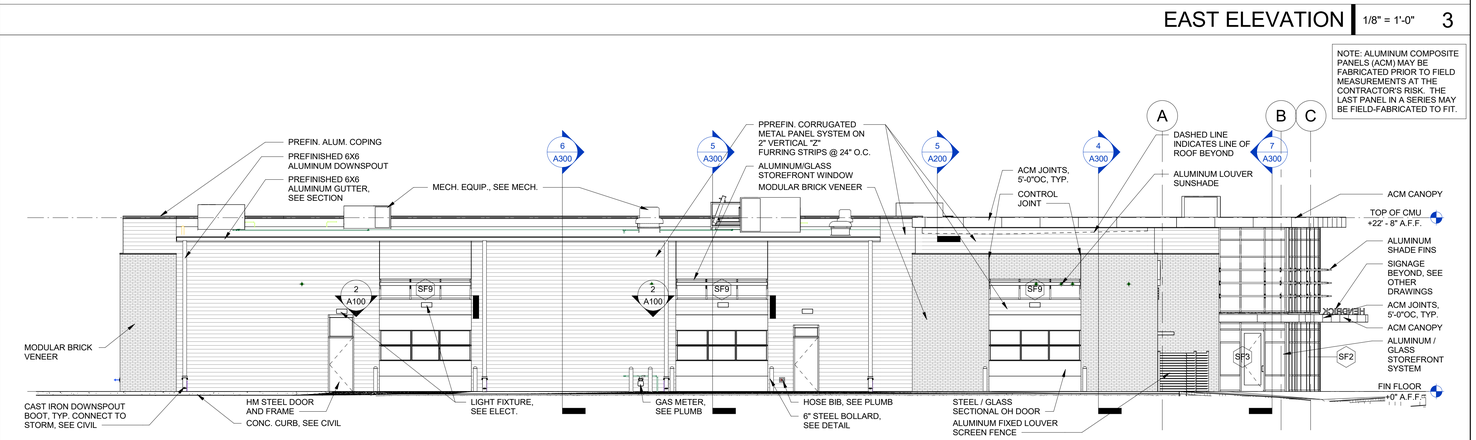
SCREEN FENCE - EAST ELEVATION 1/4" = 1'-0" 8



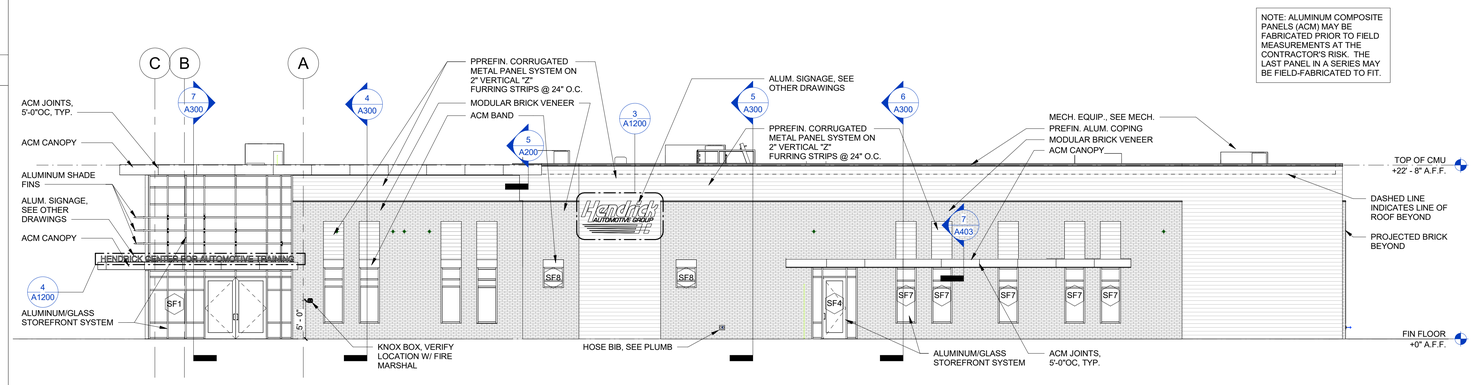
SCRN FENCE - S. ELEV. 1/4" = 1'-0" 7



SCRN FENCE - N. ELEV. 1/4" = 1'-0" 6



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



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

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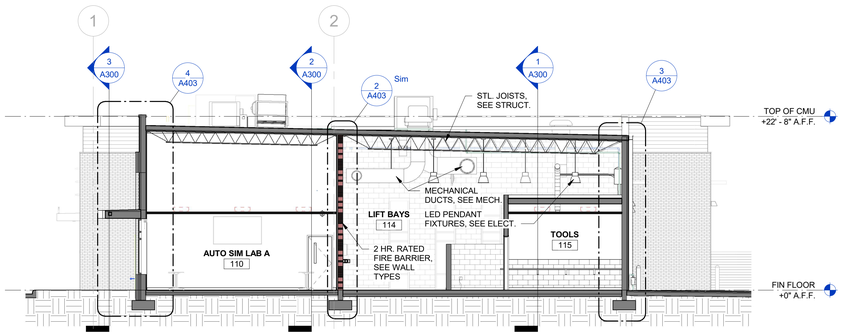
EXTERIOR ELEVATIONS

DATE: 3/3/2025
PROJECT NO: 23014

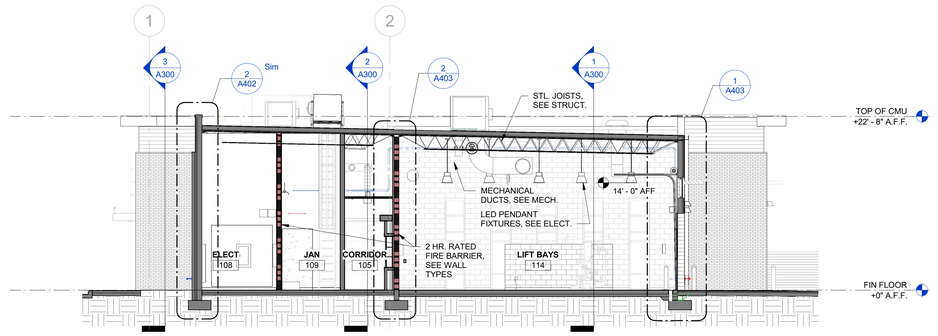
REVISIONS
NO: DATE: DESCRIPTION:

3-3-2025

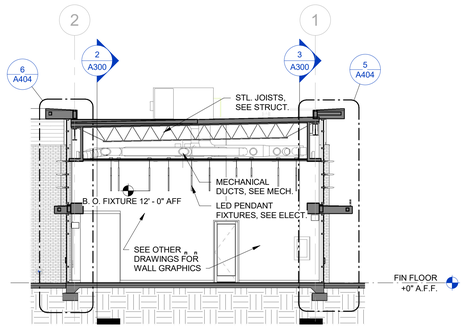
SHEET NUMBER
A200



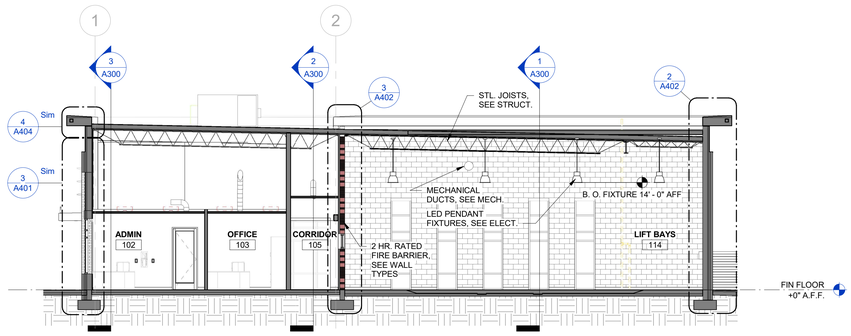
BUILDING SECTION/SIM LAB A (110)+LIFT BAYS (114) WEST ELEVATION | 1/8" = 1'-0" | 6



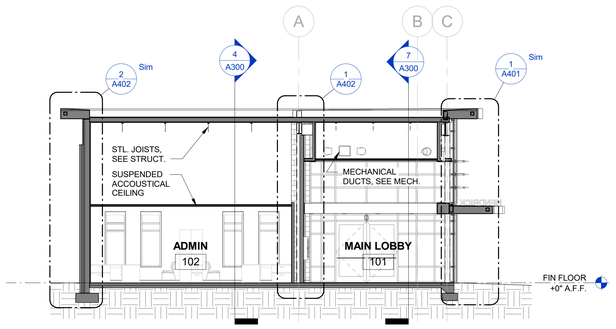
BUILDING SECTION/LIFT BAYS (114) WEST ELEVATION | 1/8" = 1'-0" | 5



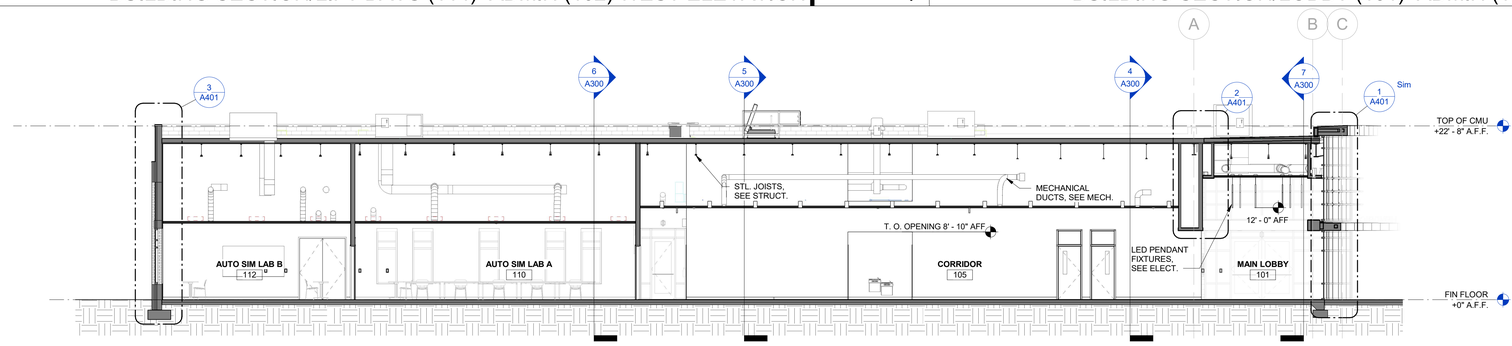
BUILDING SECTION/LOBBY (101) | 1/8" = 1'-0" | 7



BUILDING SECTION/LIFT BAYS (114)+ADMIN (102) WEST ELEVATION | 1/8" = 1'-0" | 4



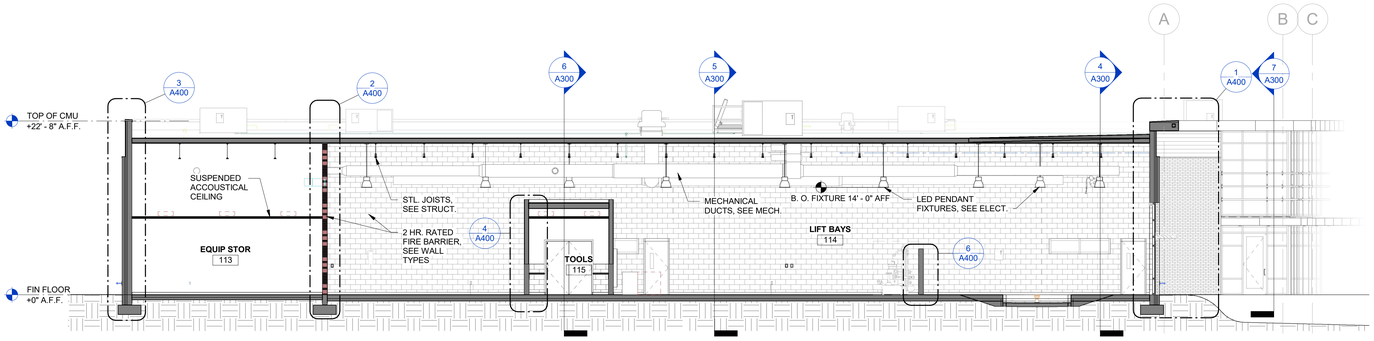
BUILDING SECTION/LOBBY (101)+ADMIN (102) | 1/8" = 1'-0" | 3



BUILDING SECTION/CORRIDOR (105) SOUTH ELEVATION | 1/8" = 1'-0" | 2

WALL RATING LEGEND:

2 HOUR RATED FIRE BARRIER, SEE UL U905 / U419



BUILDING SECTION/LIFT BAYS (114) SOUTH ELEVATION | 1/8" = 1'-0" | 1

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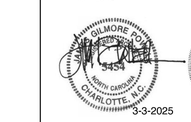
BUILDING SECTIONS

DATE: 3/3/2025
PROJECT NO: 23014

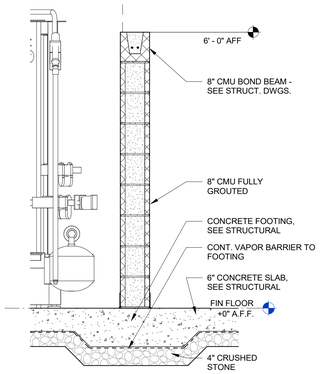
REVISIONS

NO:	DATE:	DESCRIPTION:



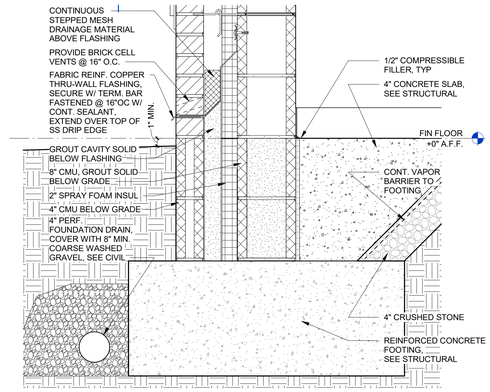
SHEET NUMBER

A300



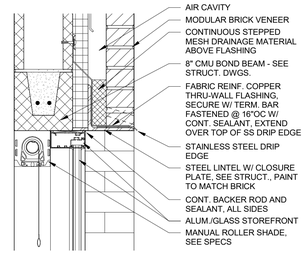
REF:1/A300

LOW WALL - LIFT BAYS (114) | 3/4" = 1'-0" | 6



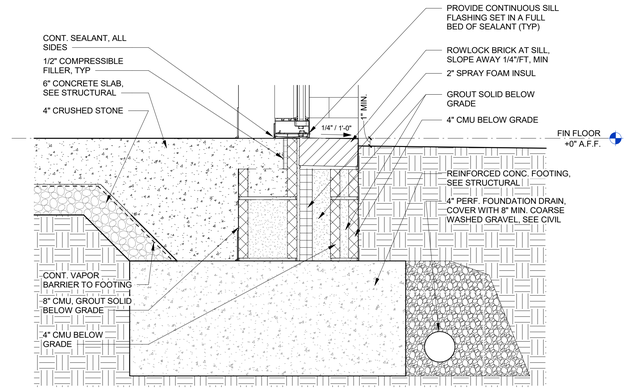
REF:3/A400

DETAIL AT TYP WALL FOOTING | 1 1/2" = 1'-0" | 8



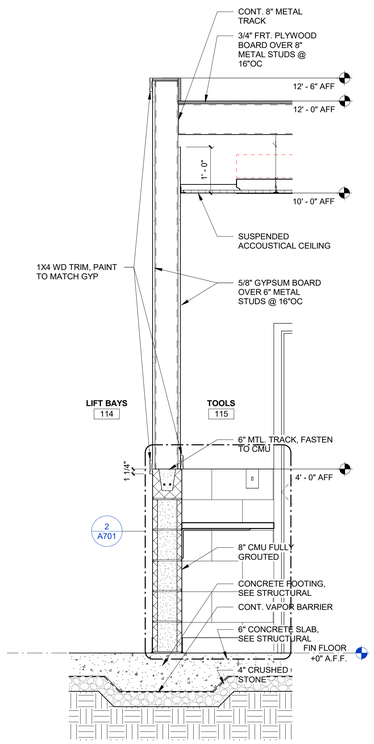
REF:1/A400

HEAD DETAIL AT LIFT BAY WINDOWS | 1 1/2" = 1'-0" | 7



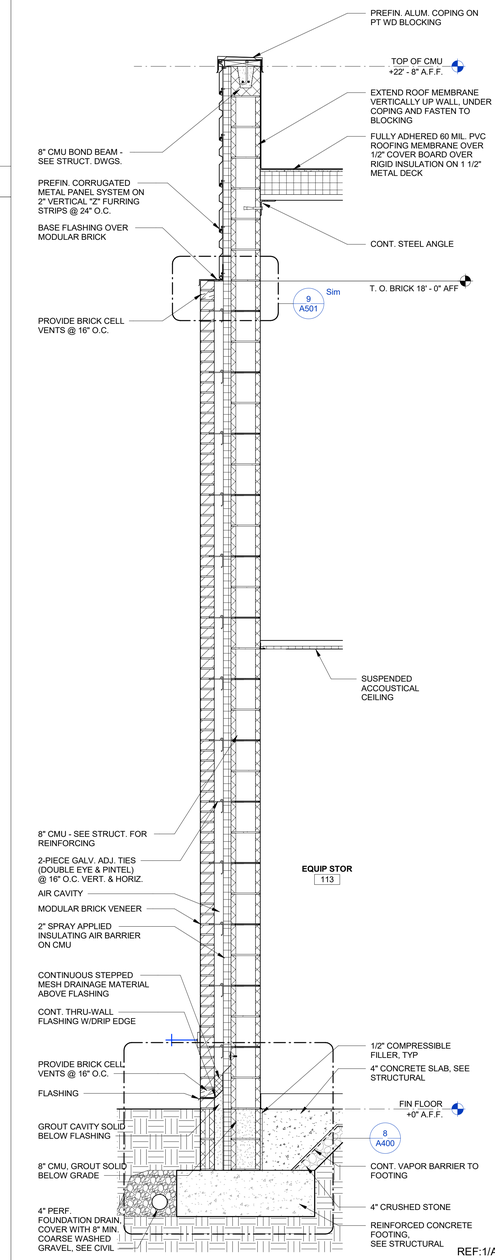
REF:1/A400

FOUNDATION DETAIL AT LIFT BAY WINDOW | 1 1/2" = 1'-0" | 5



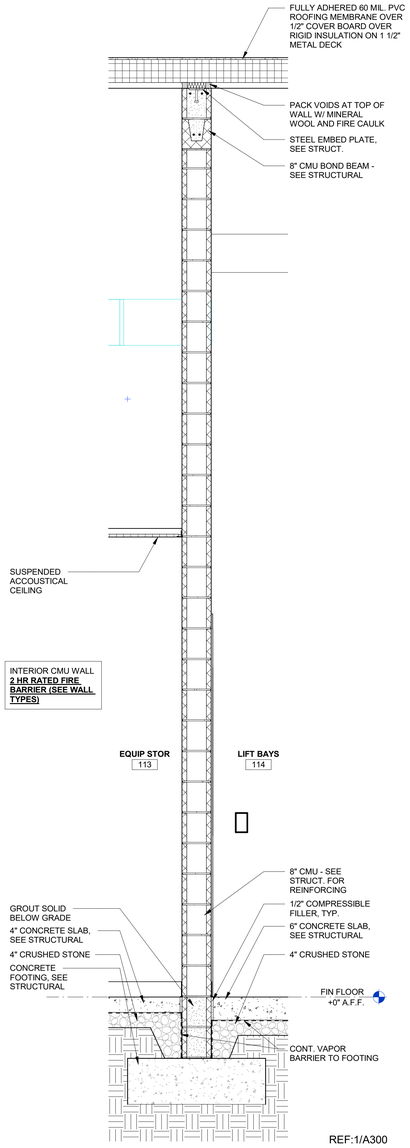
REF:1/A300

WEST WALL - TOOLS (115) | 3/4" = 1'-0" | 4



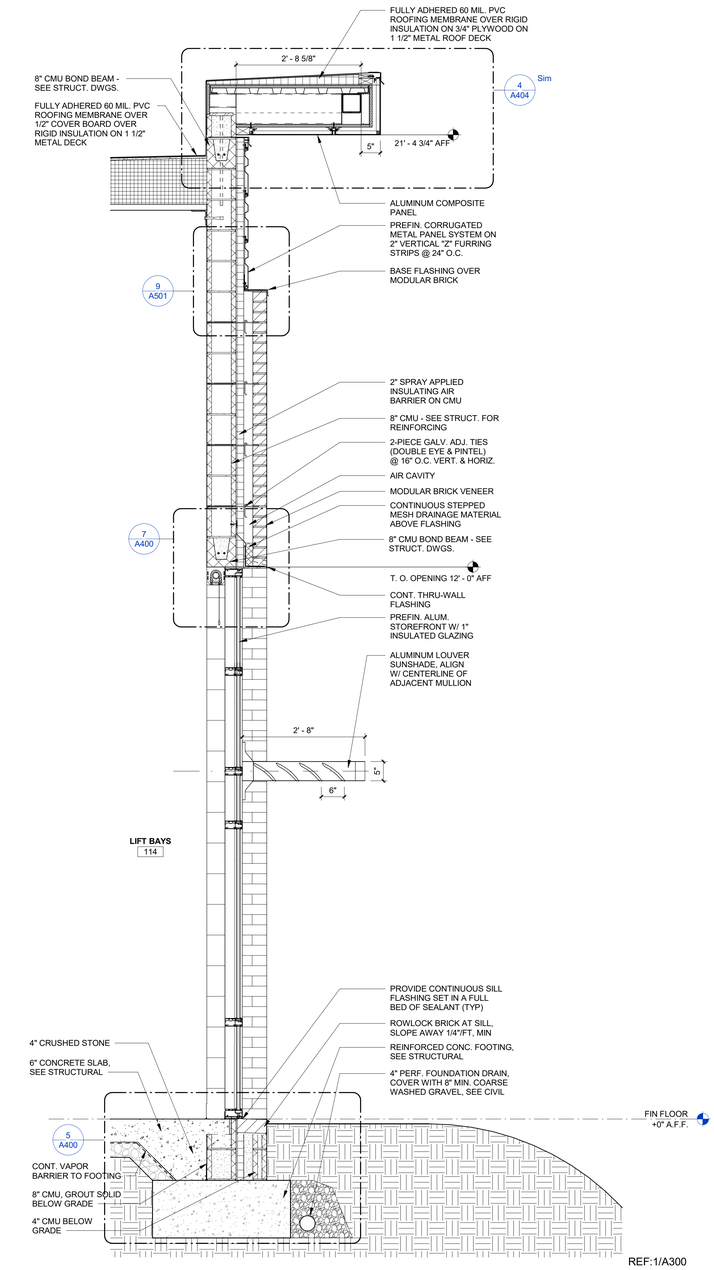
REF:1/A300

WEST WALL - EQUIP STOR (113) | 3/4" = 1'-0" | 3



REF:1/A300

WEST WALL - LIFT BAYS (114) | 3/4" = 1'-0" | 2



REF:1/A300

EAST WALL - LIFT BAYS (114) | 3/4" = 1'-0" | 1

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BID DOCUMENTS

WALL SECTIONS & DETAILS

DATE: 3/3/2025
PROJECT NO: 23014

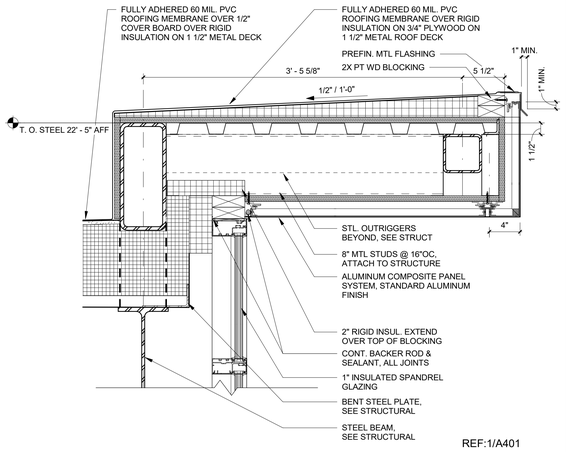
REVISIONS

NO:	DATE:	DESCRIPTION:

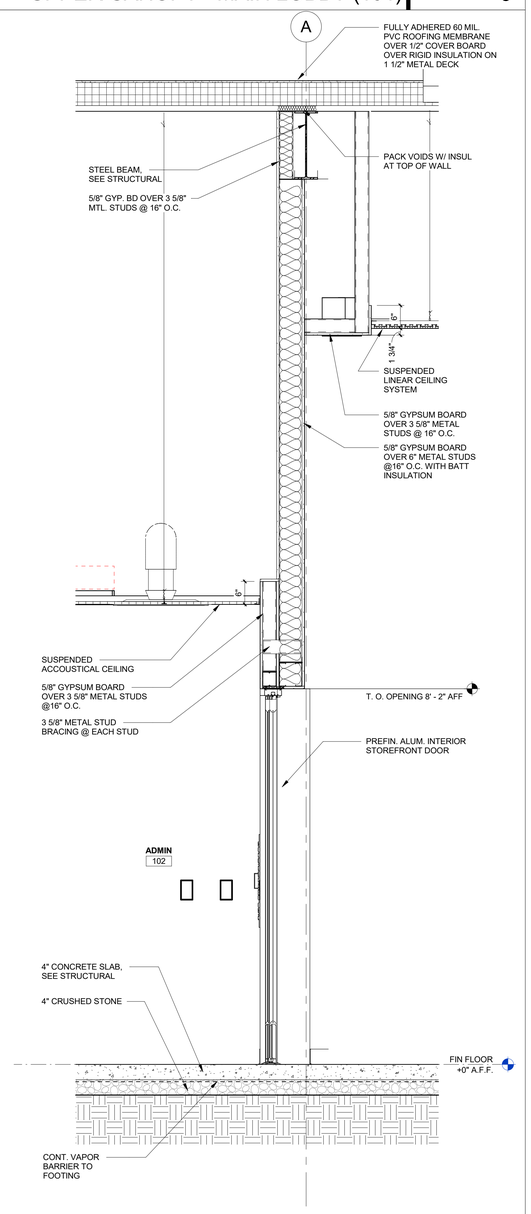
3-3-2025

SHEET NUMBER

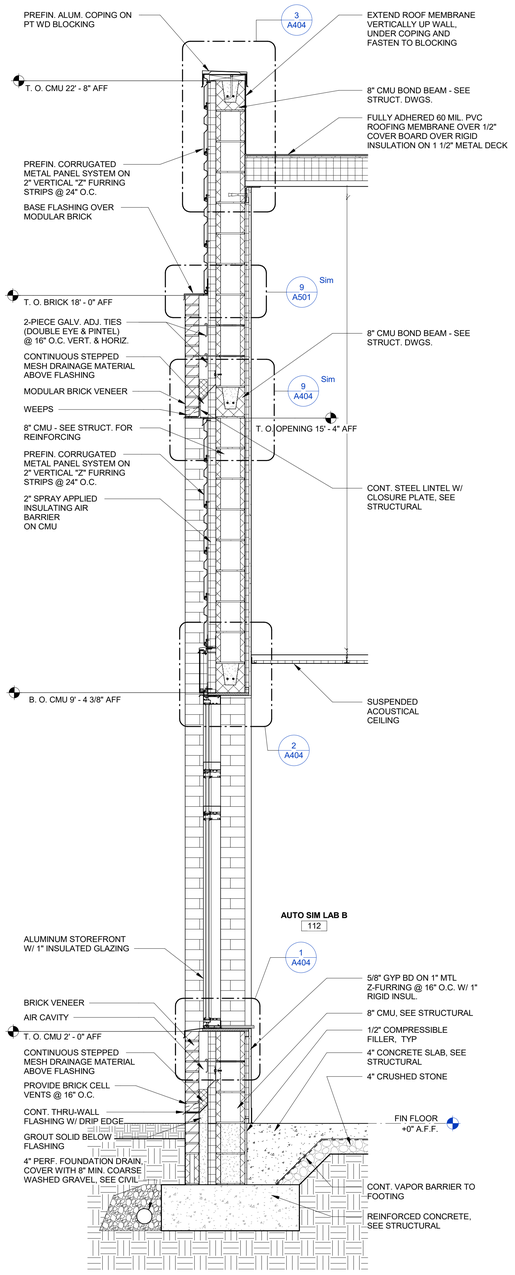
A400



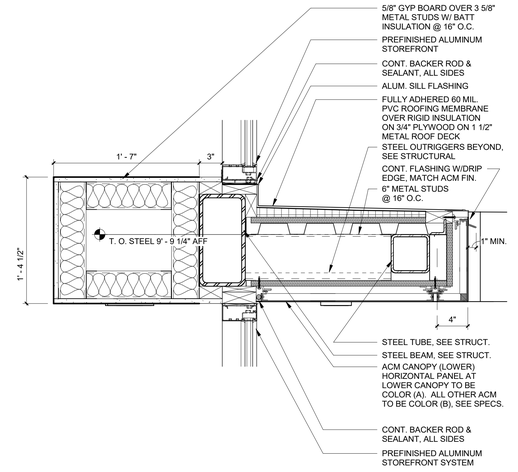
UPPER CANOPY - MAIN LOBBY (101) 1 1/2" = 1'-0" 6



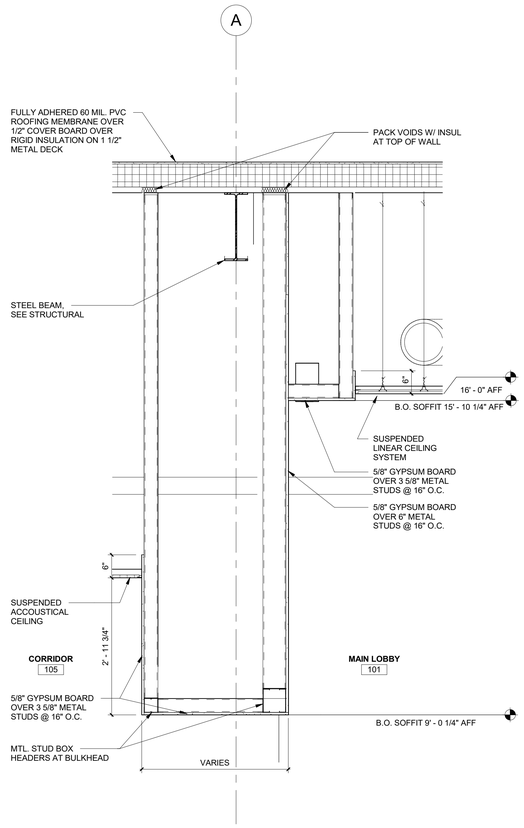
WEST WALL - MAIN LOBBY (101) 3/4" = 1'-0" 4



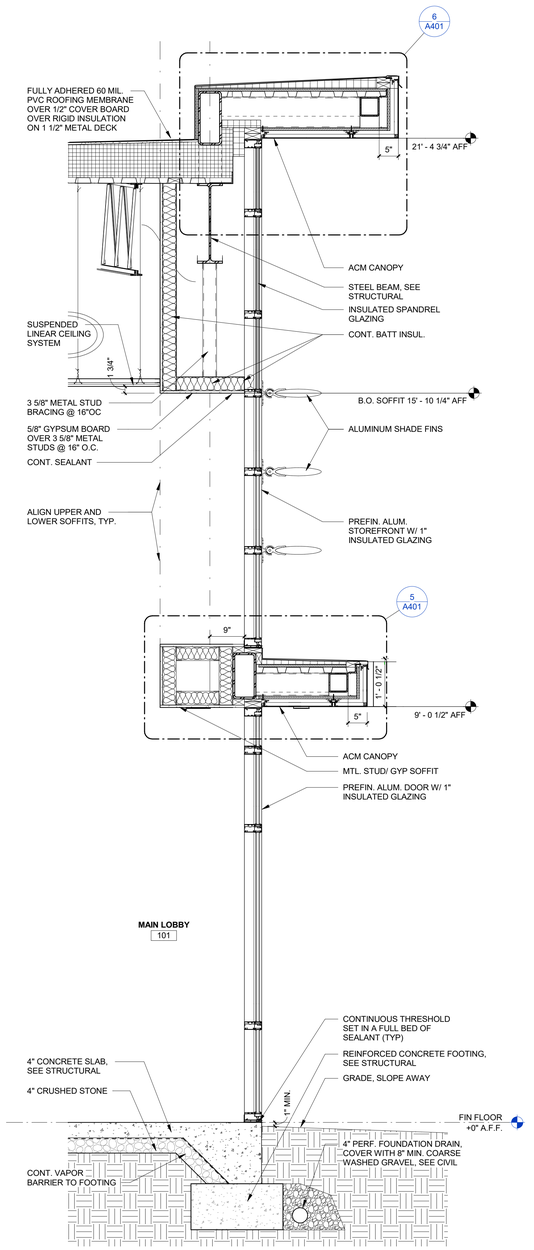
WEST WALL - AUTO SIM LAB B (112) 3/4" = 1'-0" 3



LOW CANOPY - MAIN LOBBY (101) 1 1/2" = 1'-0" 5



WEST SOFFIT - MAIN LOBBY (101) 3/4" = 1'-0" 2



EAST WALL - MAIN LOBBY (101) 3/4" = 1'-0" 1

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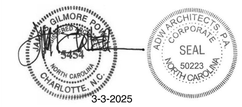
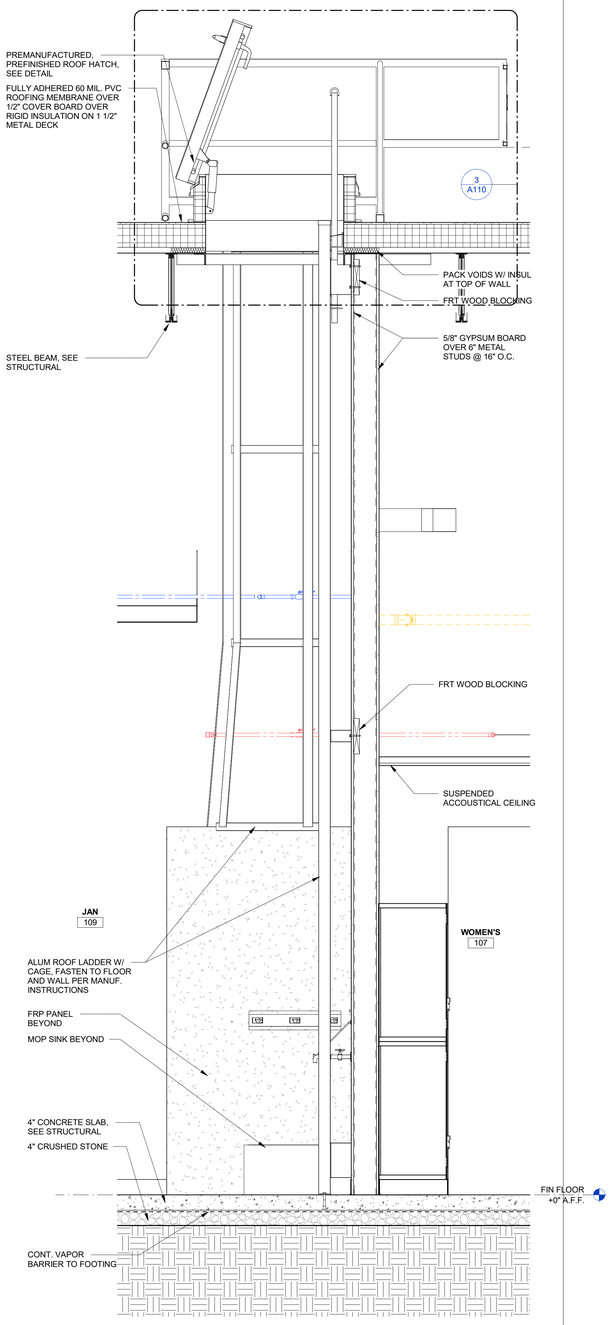


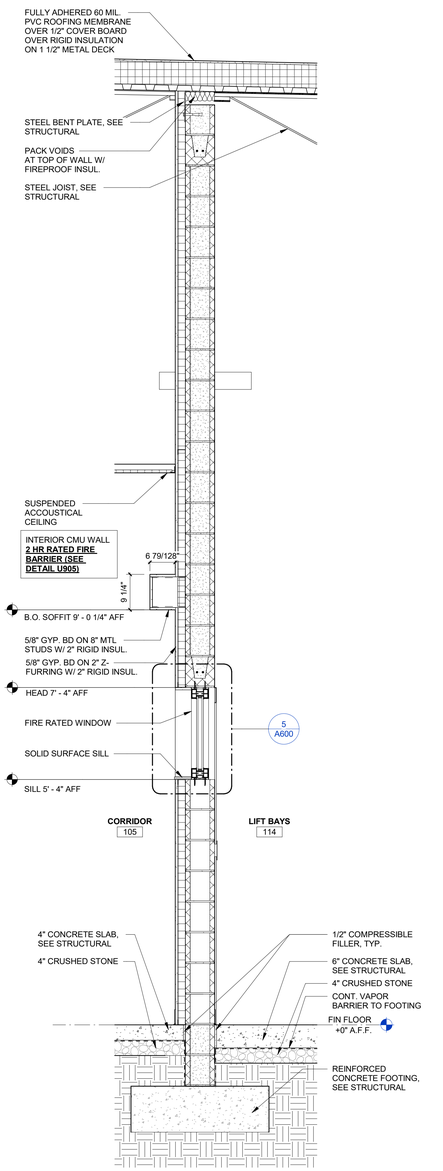
SHEET NUMBER

A401



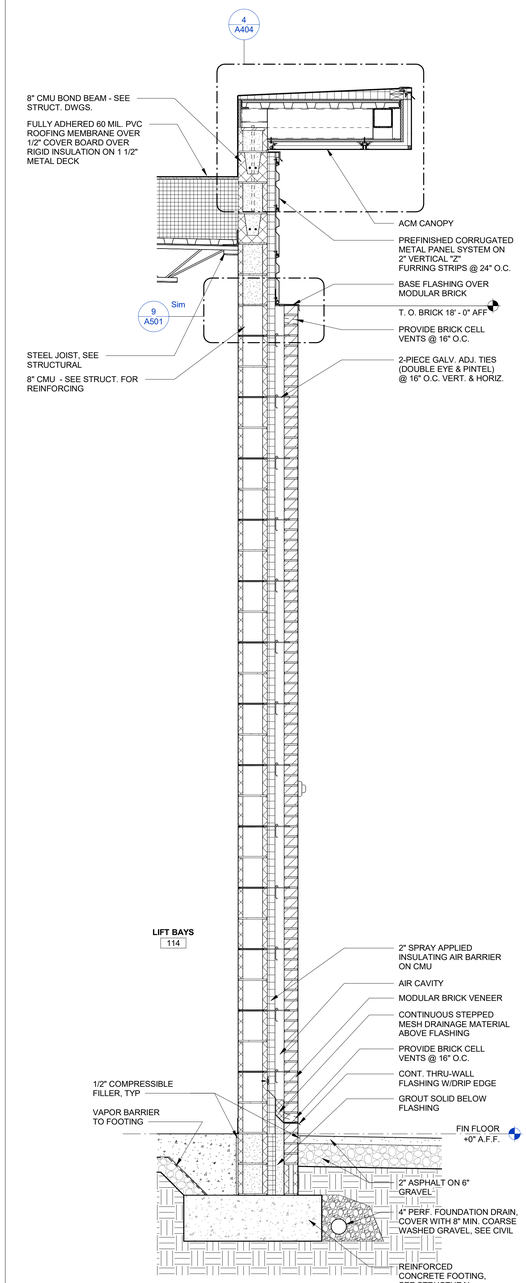
REF:1/A100

ROOF LADDER / HATCH - JANITOR (109) | 3/4" = 1'-0" | 4



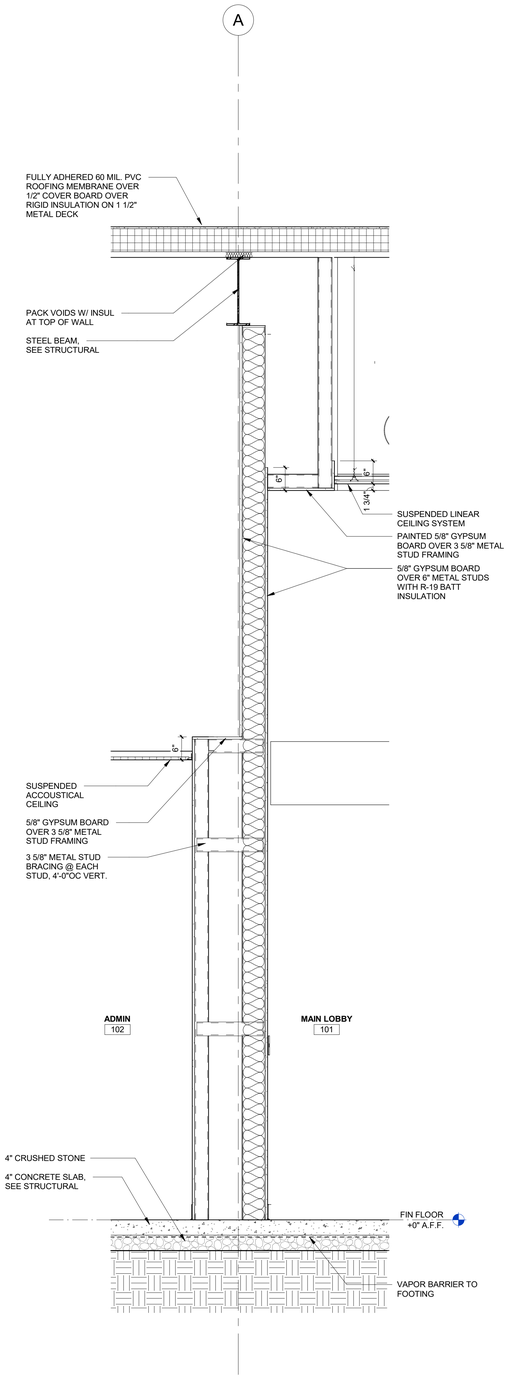
REF:4/A300

NORTH WALL - LIFT BAYS (114) | 3/4" = 1'-0" | 3



REF:3/A300

SOUTH WALL AT ALIGNMENT LIFT | 3/4" = 1'-0" | 2



REF:3/A300

WEST WALL - MAIN LOBBY / ADMIN | 3/4" = 1'-0" | 1

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WALL SECTIONS & DETAILS

DATE: 3/3/2025
PROJECT NO: 23014

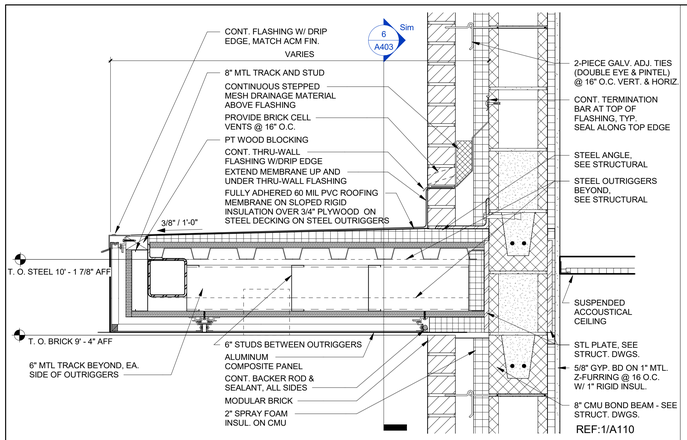
REVISIONS

NO:	DATE:	DESCRIPTION:

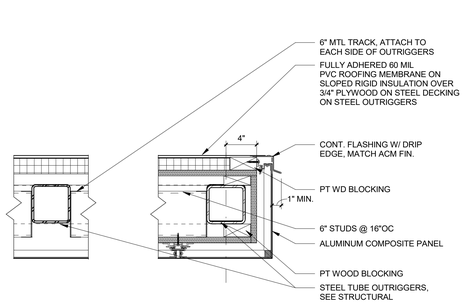
GILMORE JOHN 3434 NORTH CAROLINA CHARLOTTE, N.C.
ADW ARCHITECTS, P.A. CORPORATE SEAL 50223 NORTH CAROLINA
3-3-2025

SHEET NUMBER

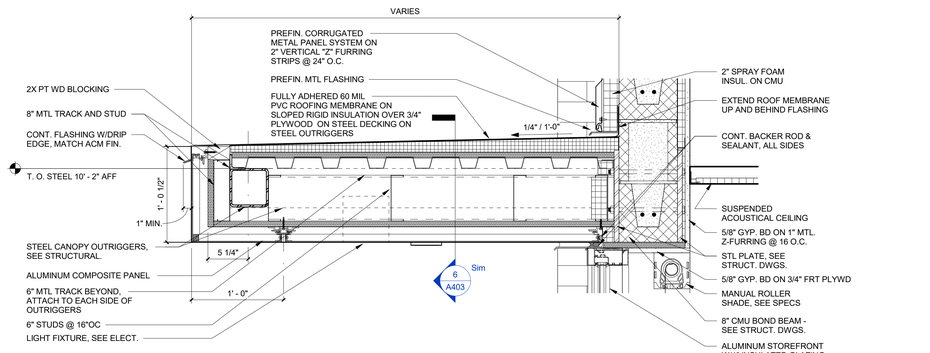
A402



NORTH CANOPY @ BRICK 1 1/2" = 1'-0" 7



NORTH CANOPY RAKE EDGE 1 1/2" = 1'-0" 6



NORTH CANOPY @ METAL PANEL 1 1/2" = 1'-0" 5

NORTH WALL - SIM LAB A (110) 3/4" = 1'-0" 4

SOUTH WALL - LIFT BAYS (114) 3/4" = 1'-0" 3

SOUTH WALL - CORRIDOR (105) 3/4" = 1'-0" 2

OH DOOR - LIFT BAYS (114) 3/4" = 1'-0" 1

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DATE: 3/3/2025
PROJECT NO: 23014

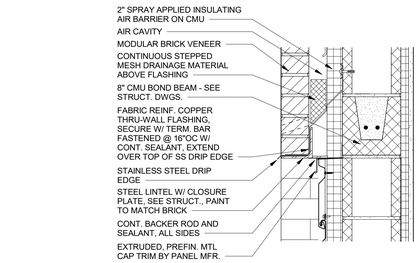
REVISIONS

NO:	DATE:	DESCRIPTION:

3-3-2025

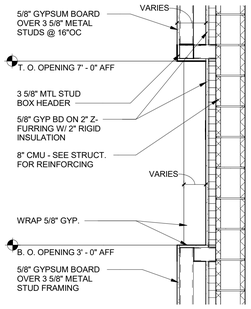
SHEET NUMBER

A403



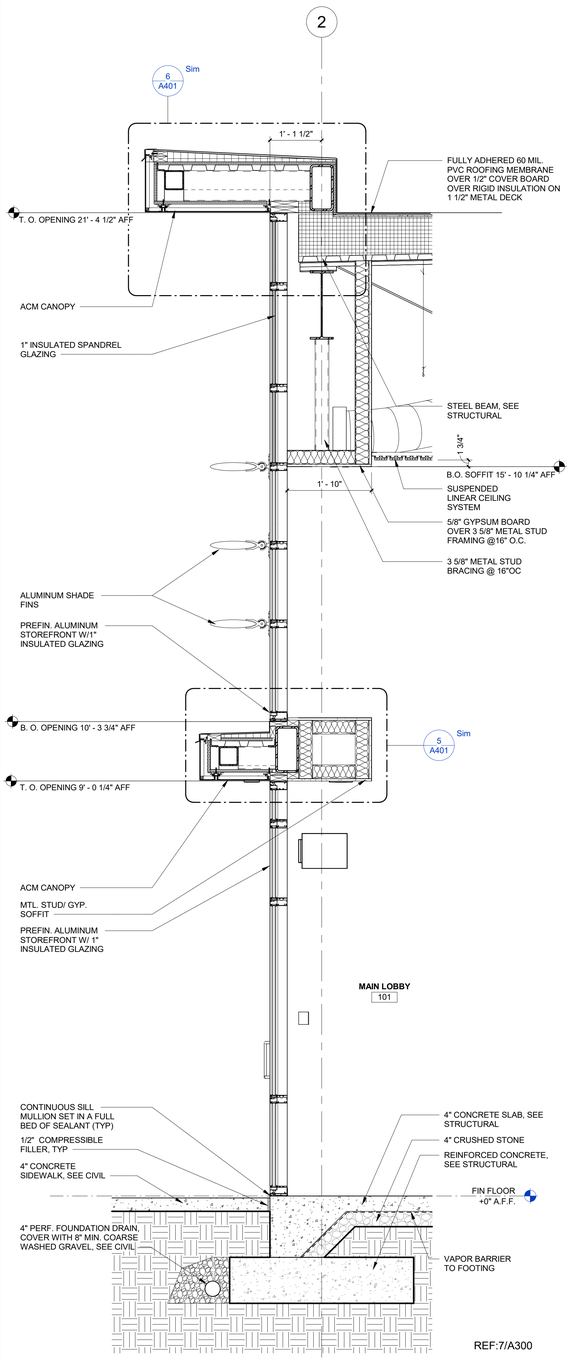
REF:3/A401

BRICK OVER MTL PANEL | 1 1/2" = 1'-0" | 9



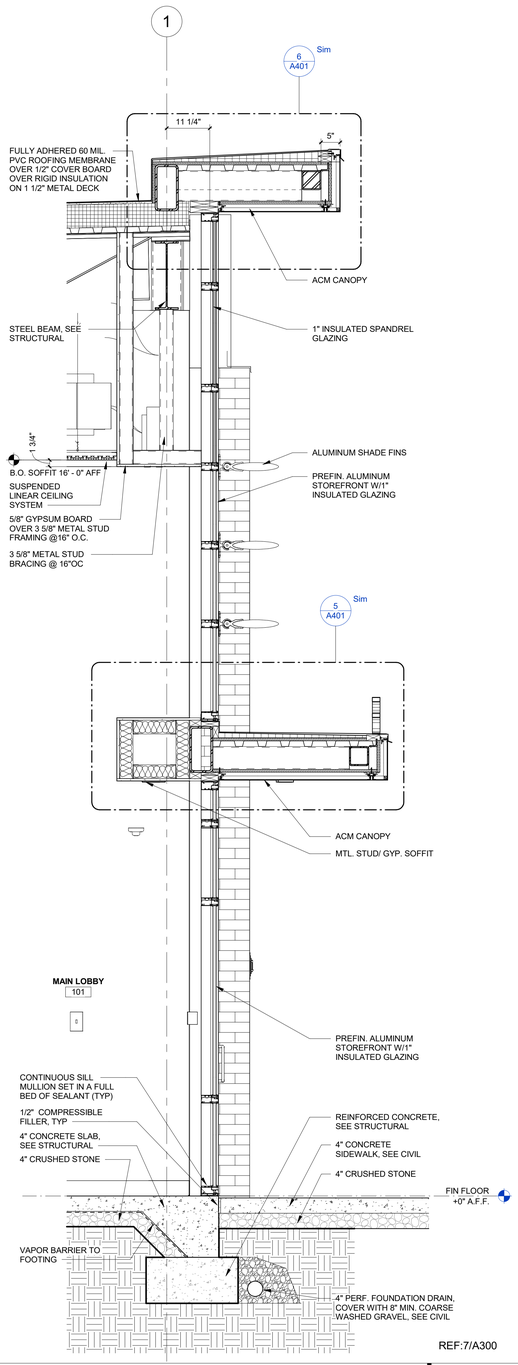
REF:1/A100

TV RECESS - CORRIDOR (105) | 3/4" = 1'-0" | 8



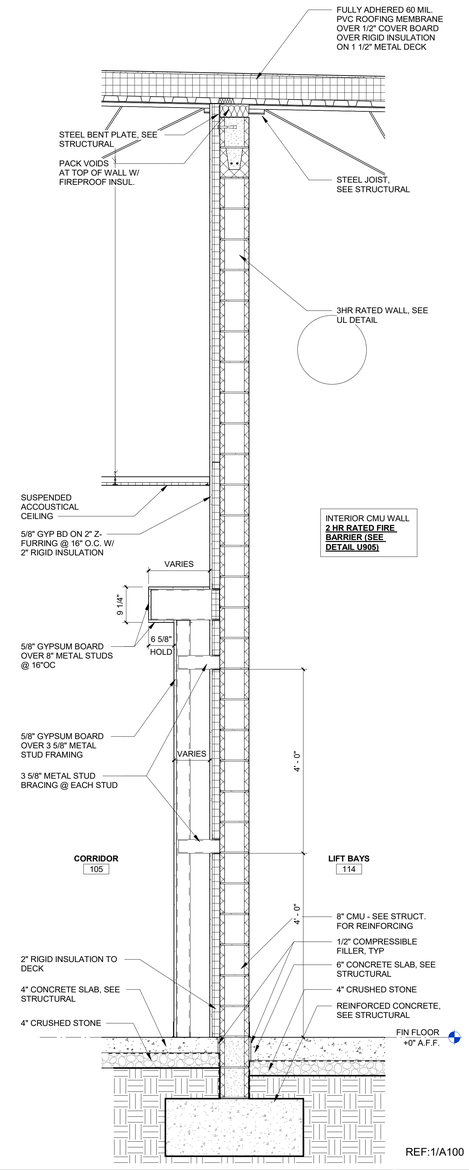
REF:7/A300

SOUTH WALL - LOBBY (101) | 3/4" = 1'-0" | 6



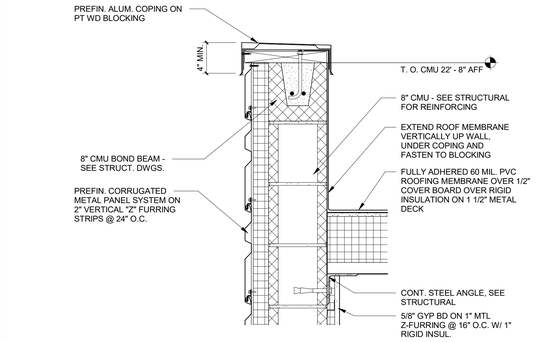
REF:7/A300

NORTH WALL - LOBBY (101) | 3/4" = 1'-0" | 5



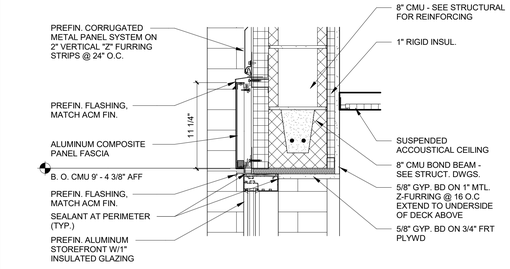
REF:1/A100

SOUTH DISPLAY WALL - CORRIDOR (105) | 3/4" = 1'-0" | 7



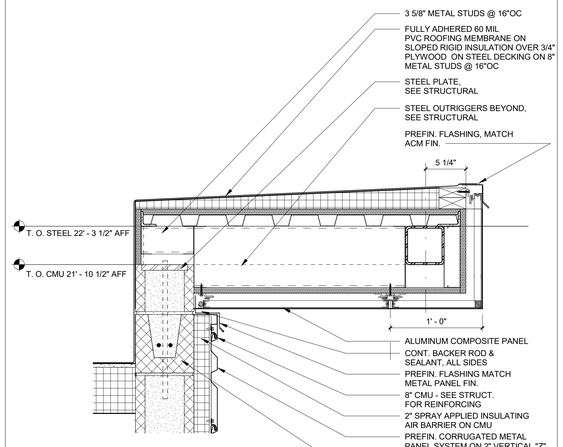
REF:3/A401

SECTION AT PARAPET | 1 1/2" = 1'-0" | 3



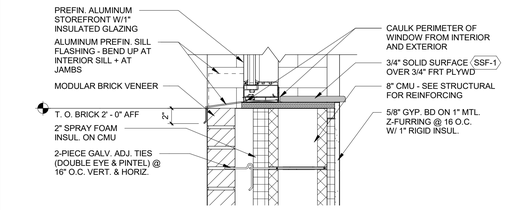
REF:3/A401

TYPICAL STOREFRONT HEAD/BRICK | 1 1/2" = 1'-0" | 2



REF:4/A300

NORTH WALL - UPPER CANOPY | 1 1/2" = 1'-0" | 4



REF:3/A401

TYPICAL STOREFRONT SILL/BRICK | 1 1/2" = 1'-0" | 1

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WALL SECTIONS & DETAILS

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

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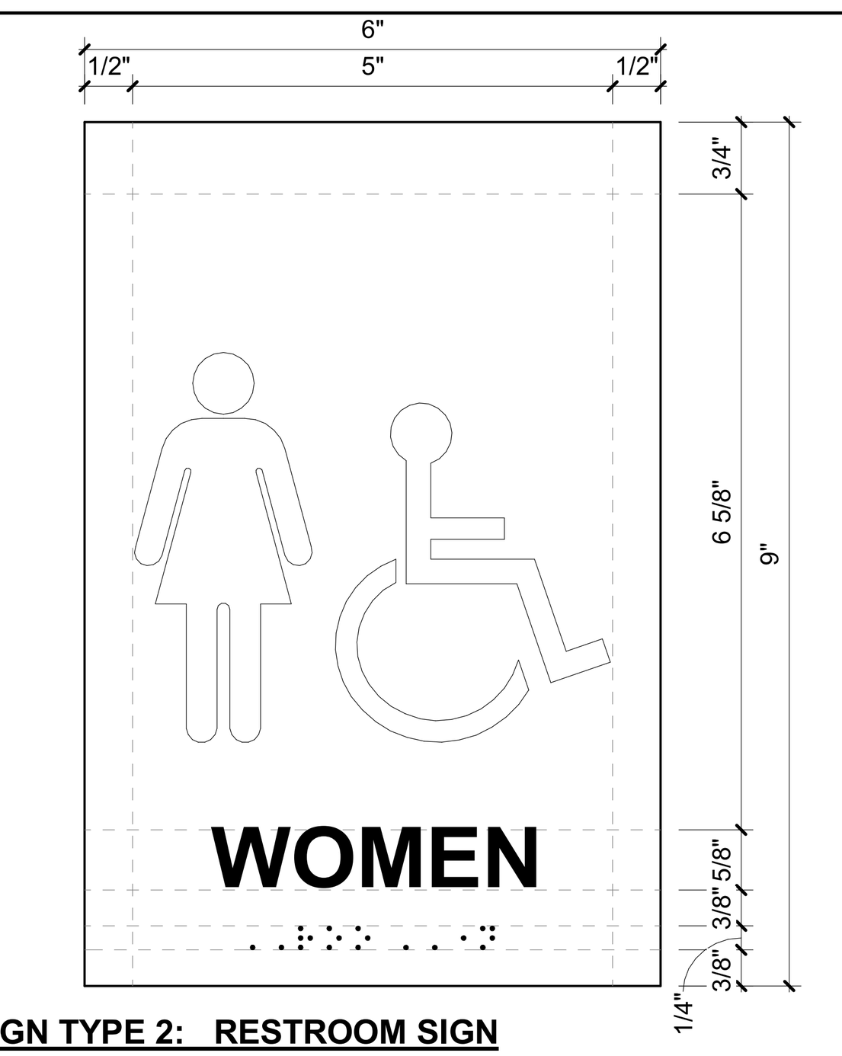
SHEET NUMBER

A404

TOILET ACCESSORIES					
SYMBOL	ACCESSORY	MOUNTING HT. (ADULT)	MANUFACTURER	MODEL	COMMENTS
TA-1	PAPER TOWEL DISPENSER	40" A.F.F. to Underside	Transcend	T870EB	Owner Furnished, Contractor Installed
TA-2	TOILET TISSUE DISPENSER	18" A.F.F.	Transcend	T370B	Owner Furnished, Contractor Installed
TA-3	MIRROR	38" A.F.F. (B.O. Mirror)	Bobrick Washroom Equipment, Inc.	B-165 Series	Custom Size 42"x78"
TA-4	36" GRAB BAR	34" A.F.F. to Centerline	Bobrick Washroom Equipment, Inc.	BOBRICK B-6806.99x36	
TA-5	42" GRAB BAR	34" A.F.F. to Centerline	Bobrick Washroom Equipment, Inc.	BOBRICK B-6806.99x42	
TA-6	18" GRAB BAR	48" A.F.F. to Centerline	Bobrick Washroom Equipment, Inc.	BOBRICK B-6806.99x18	
TA-7	SANITARY NAPKIN DISPOSAL	28" A.F.F. to Top	Bobrick Washroom Equipment, Inc.	B-35139	
TA-8	ROBE HOOK	48" A.F.F (T.O. Hook)	Bobrick Washroom Equipment, Inc.	B-549 Series	
TA-9	MOP AND BROOM HOOKS	48" A.F.F.	Bobrick Washroom Equipment, Inc.	B-223 x 24	
TA-10	SOAP DISPENSER	40" A.F.F.	Betco Clario	91968-00	Owner Furnished, Contractor Installed

GENERAL NOTES - TOILETS

1. PROVIDE CONCEALED BLOCKING FOR ALL WALL MOUNTED ITEMS.
2. APPROVED EQUALS FOR TOILET ACCESSORIES ARE BRADLEY AND AMERICAN STANDARD.
3. THE HEIGHT OF ALL ACCESSIBLE ADULT WATER CLOSETS SHALL BE 17" A.F.F. TO THE TOP OF THE TOILET SEAT.
4. THE HEIGHT OF ALL ACCESSIBLE URINALS SHALL BE 17" A.F.F. TO THE RIM.
5. PROVIDE 48" WIDE x 8' HIGH SANITARY WALL FINISH ON BOTH SIDES OF MOP SINK. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
6. TP - TRANSITION POINT BETWEEN FINISHES, OR CHANGES IN HEIGHTS.
7. G.C. TO COORDINATE INSTALLATION OF LIGHTS AND MIRRORS (TO BE CENTERED OVER SINKS).

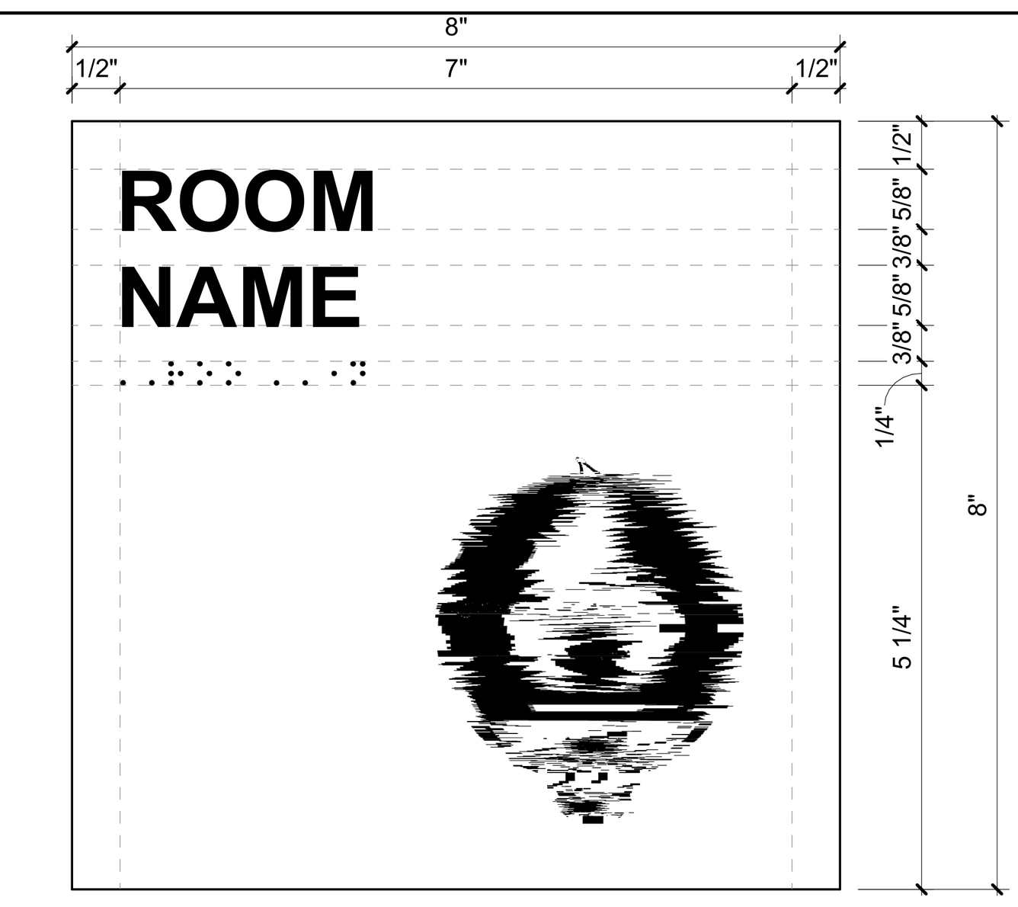


SIGN TYPE 2: RESTROOM SIGN

MATERIAL: SIGN SHALL BE 1/8" THICK PHOTOPOLYMER PLAQUE, EDGES AND FACE TO MATCH PMS #404, MATTE FINISH.

GRAPHICS: ALL GRAPHICS AND SYMBOLS SHALL BE RAISED 1/32", COLOR WHITE, TYPE STYLE "HELVETICA BOLD". BRAILLE SHALL BE GRADE II, RAISED 1/32", COLOR TO MATCH SIGN BACKGROUND. ROOM NUMBER SHALL BE 7/8" HIGH, ROOM NAME SHALL BE 5/8" HIGH. **TEXT:** ALL LETTERS SHALL BE UPPERCASE ONLY WITH SHARPLY DEFINED EDGES.

MOUNTING: SECURE TO PAINTED GYPSUM BOARD WALL WITH DOUBLE-COATED NEOPRENE TAPE. MOUNT SIGN 4" FROM DOOR FRAME TO SIGN EDGE, AND 5'-0" ABOVE FLOOR TO SIGN CENTERLINE.

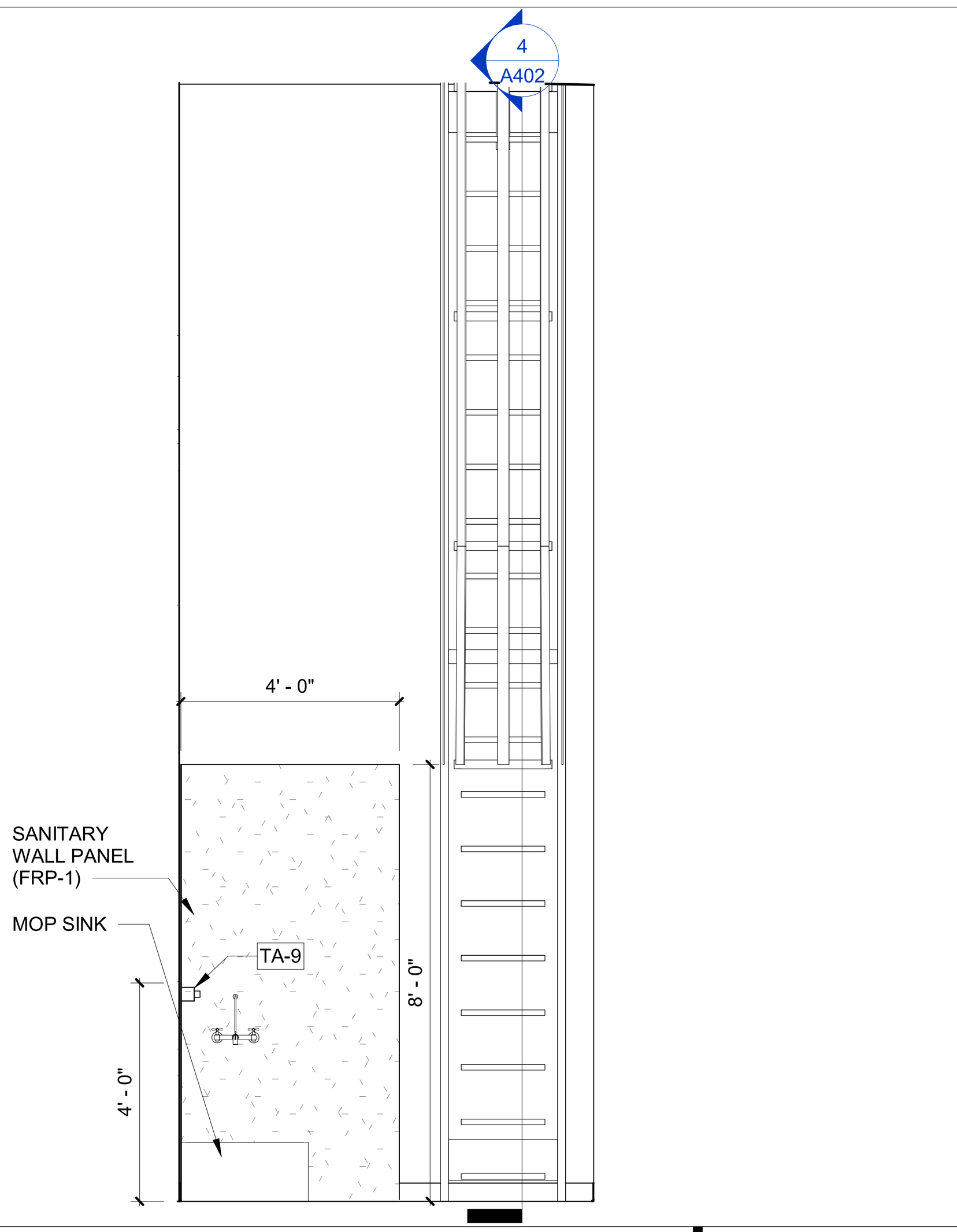


SIGN TYPE 1: ROOM NUMBER / ROOM NAME SIGN

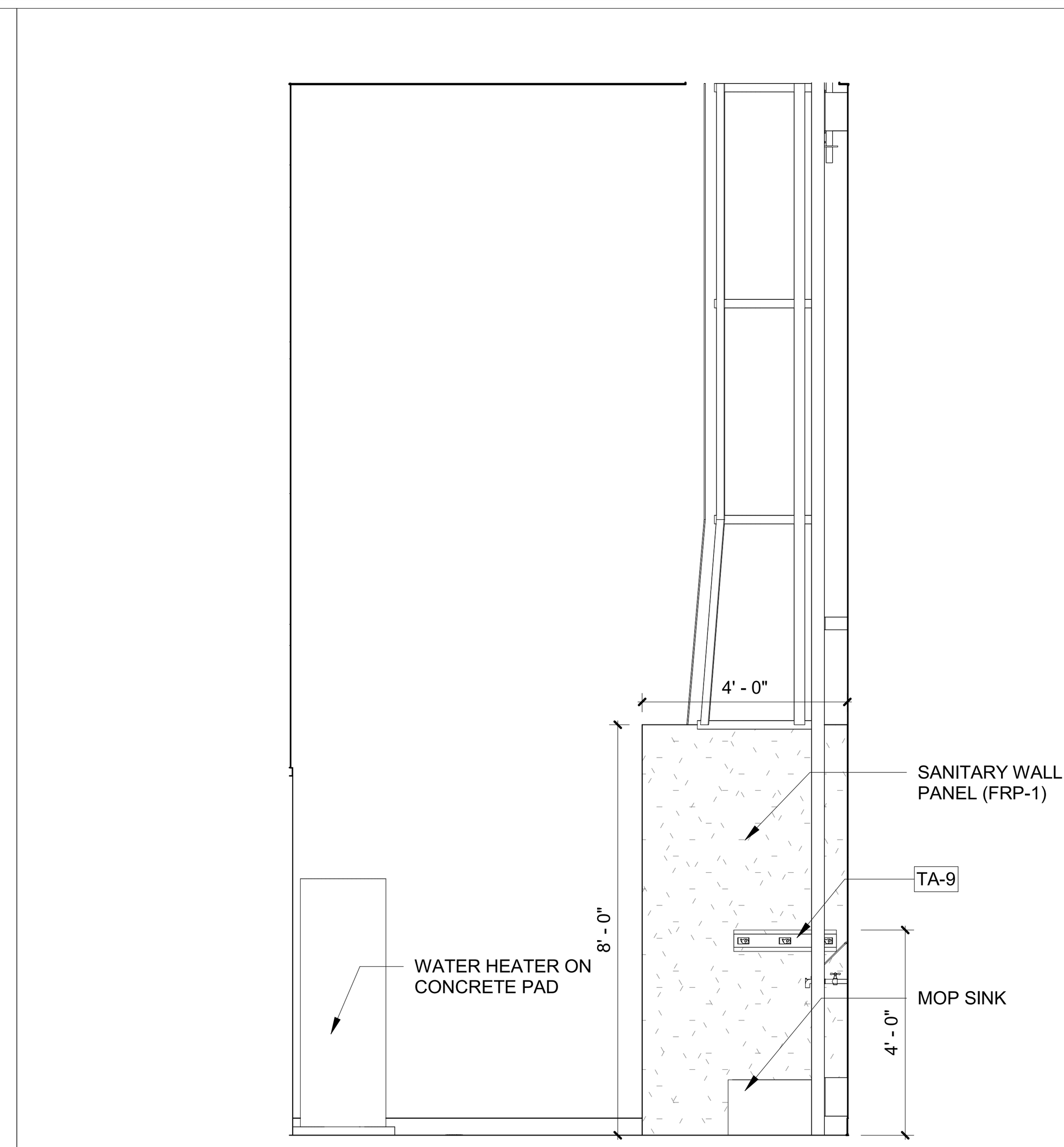
MATERIAL: SIGN SHALL BE 1/8" THICK PHOTOPOLYMER PLAQUE, EDGES AND FACE TO MATCH PMS #404, MATTE FINISH.

GRAPHICS: ALL GRAPHICS SHALL BE RAISED 1/32", COLOR WHITE, TYPE STYLE "HELVETICA BOLD". BRAILLE SHALL BE GRADE II, RAISED 1/32", COLOR TO MATCH SIGN BACKGROUND. ROOM NUMBER SHALL BE 7/8" HIGH, ROOM NAME SHALL BE 5/8" HIGH. **TEXT:** ALL LETTERS SHALL BE UPPERCASE ONLY WITH SHARPLY DEFINED EDGES.

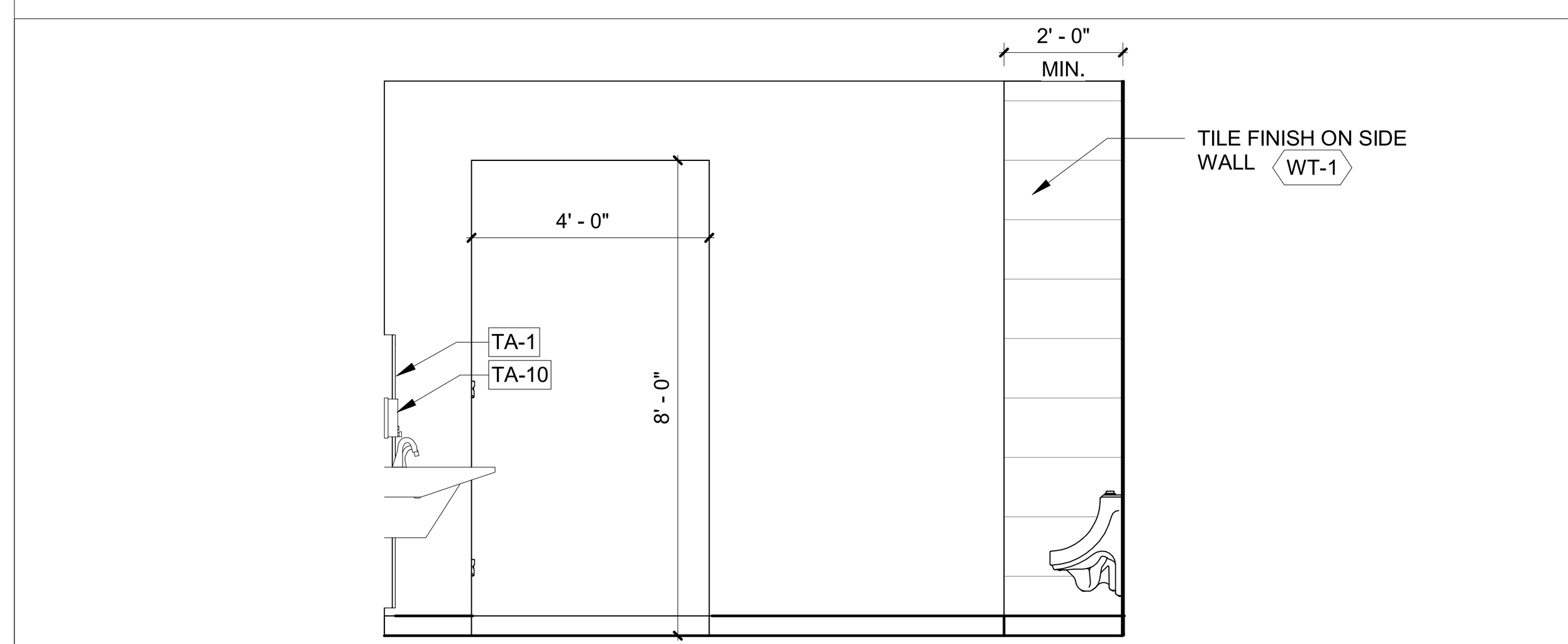
MOUNTING: SECURE TO PAINTED GYPSUM BOARD WALL, OR GLASS WITH DOUBLE-COATED NEOPRENE TAPE. WHERE NOTED IN SIGN MESSAGE SCHEDULE, SIGN SHALL HAVE 1/16" THICK ACRYLIC BACKPLATE PAINTED TO MATCH PMS #404, MOUNTED TO GLASS BEHIND SIGN WITH DOUBLE-FACE NEOPRENE TAPE. MOUNT SIGN 4" FROM DOOR FRAME TO SIGN EDGE, AND 5'-0" ABOVE FLOOR TO SIGN CENTERLINE.



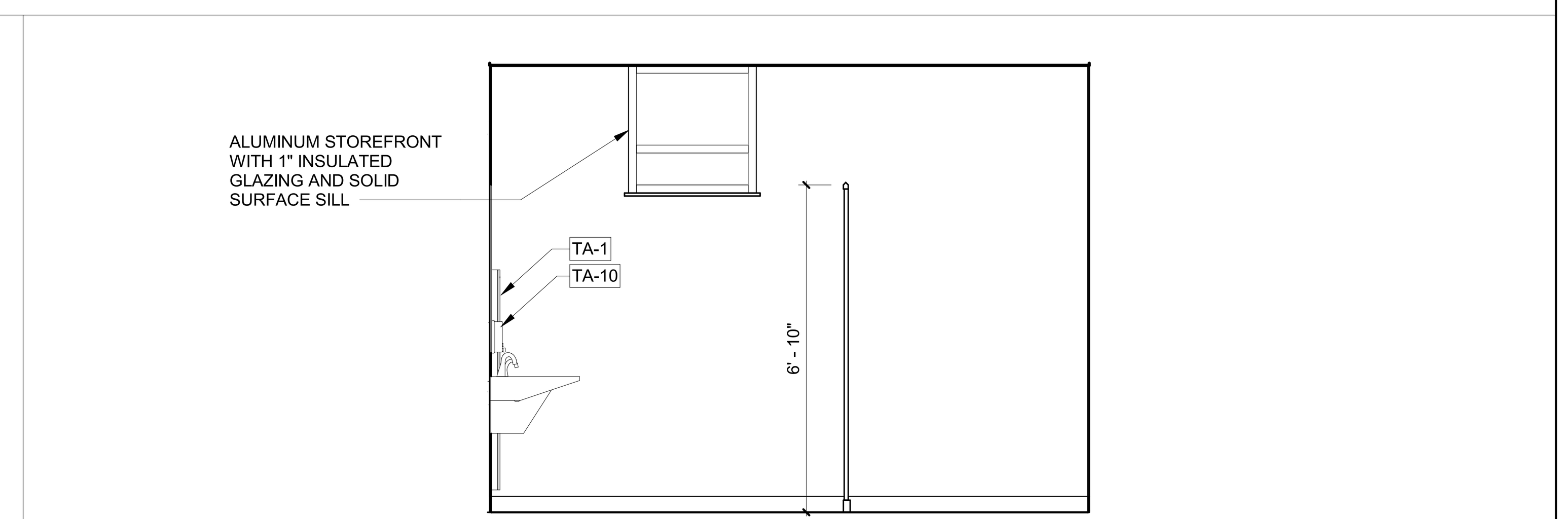
EAST WALL - JANITOR (109) 3/8" = 1'-0" 12



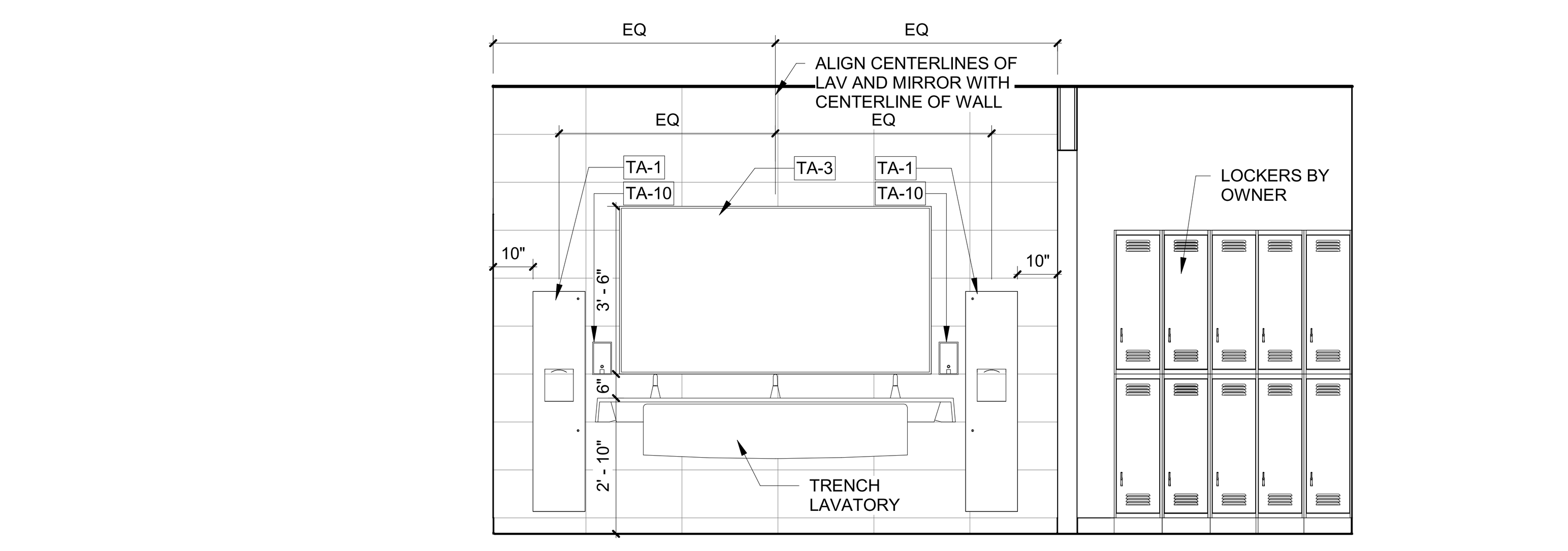
NORTH WALL- JANITOR (109) 3/8" = 1'-0" 11



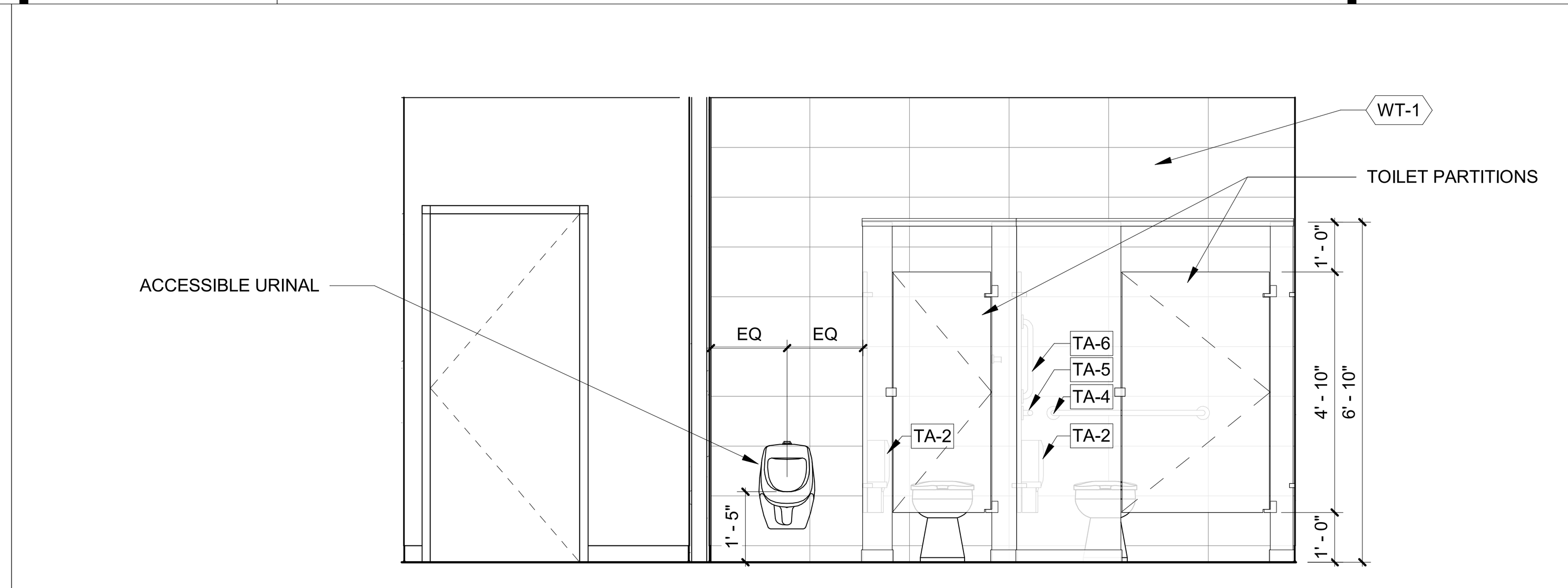
SOUTH WALL - MEN'S (106) 3/8" = 1'-0" 8



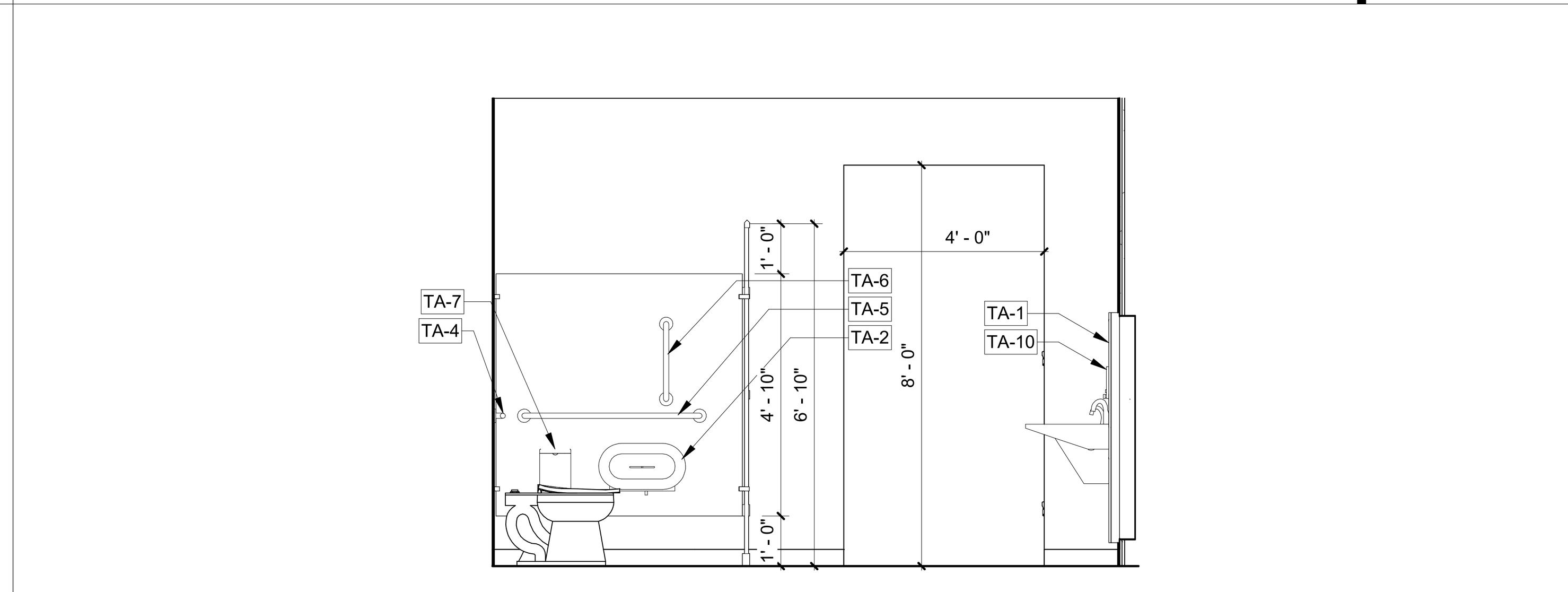
NORTH WALL - WOMEN'S (107) 3/8" = 1'-0" 4



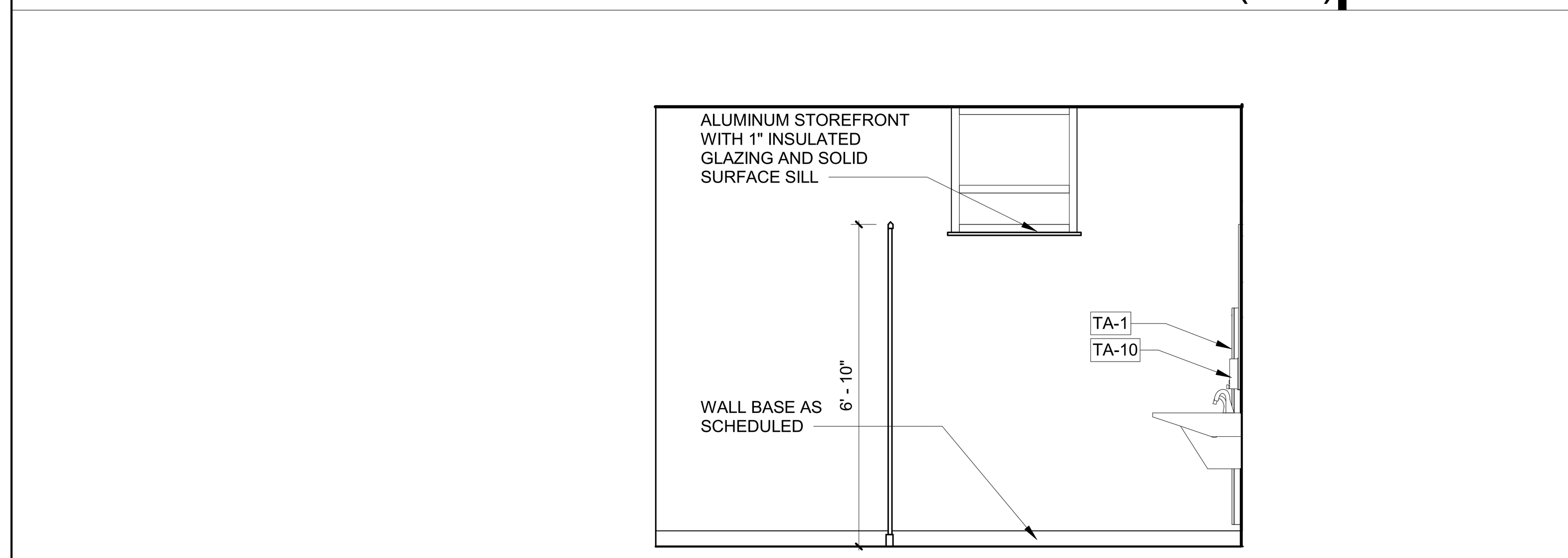
EAST WALL - MEN'S (106) 3/8" = 1'-0" 10



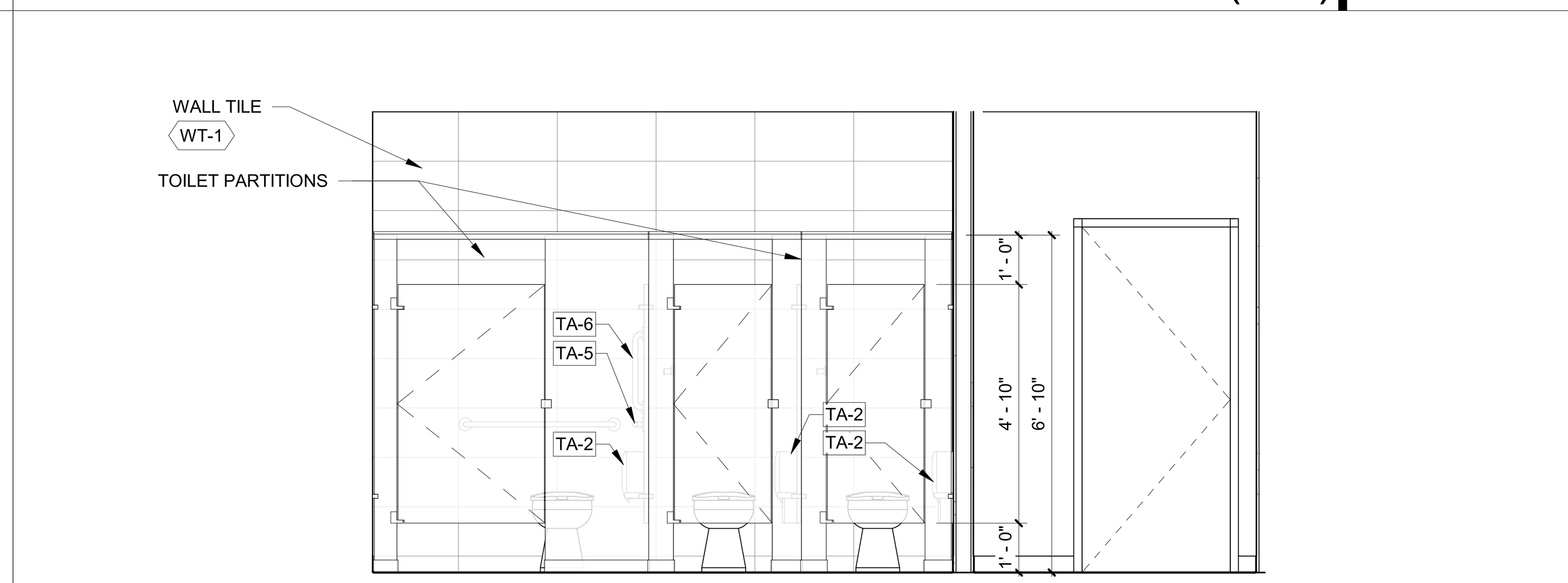
WEST WALL - MEN'S (106) 3/8" = 1'-0" 7



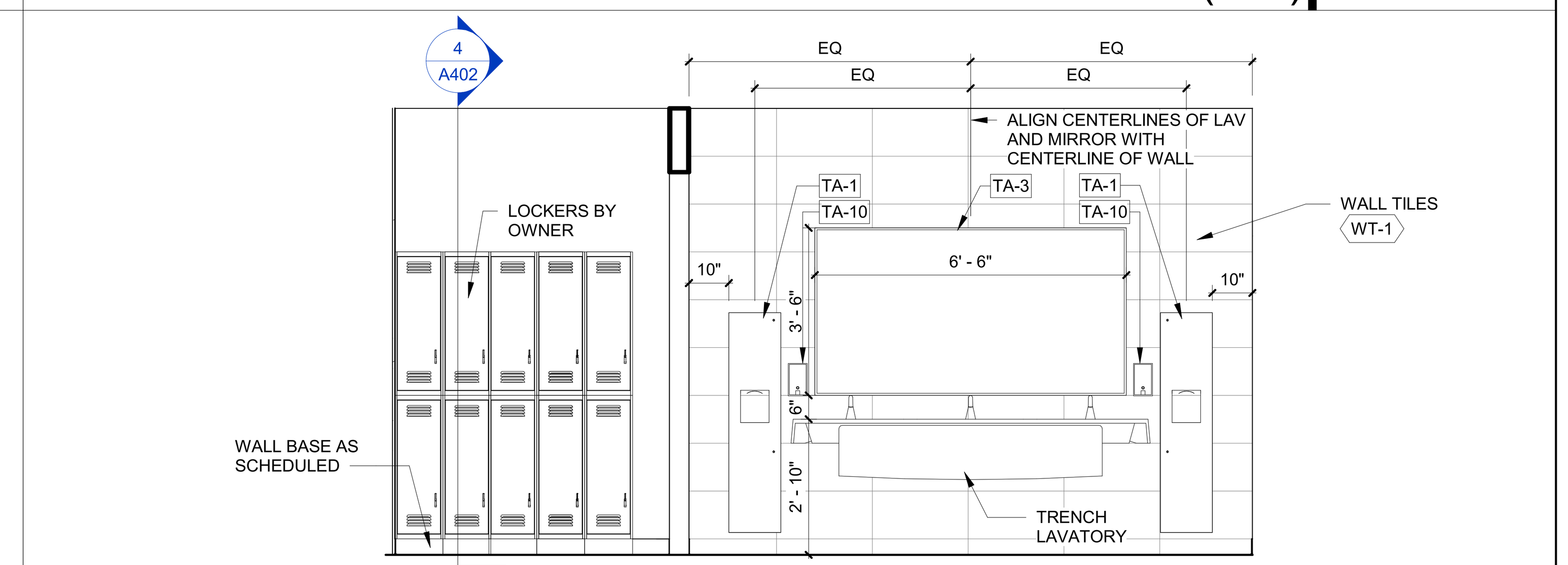
SOUTH WALL - WOMEN'S (107) 3/8" = 1'-0" 3



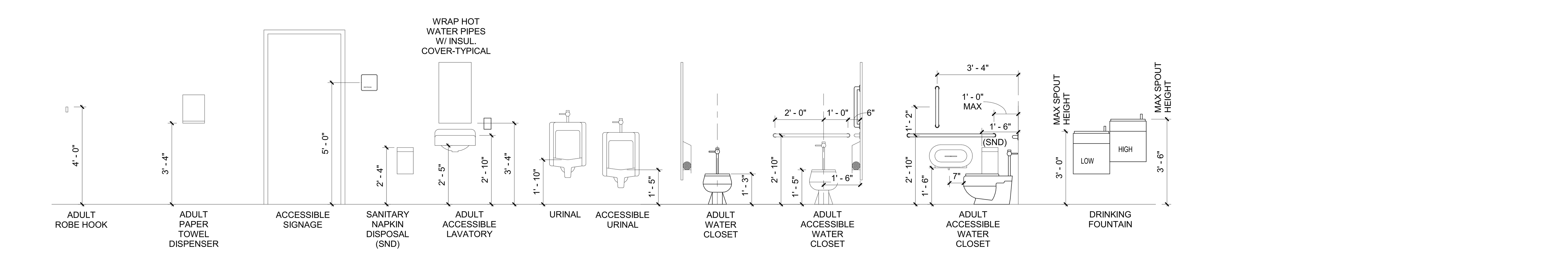
NORTH WALL - MEN'S (106) 3/8" = 1'-0" 9



EAST WALL - WOMEN'S (107) 3/8" = 1'-0" 6

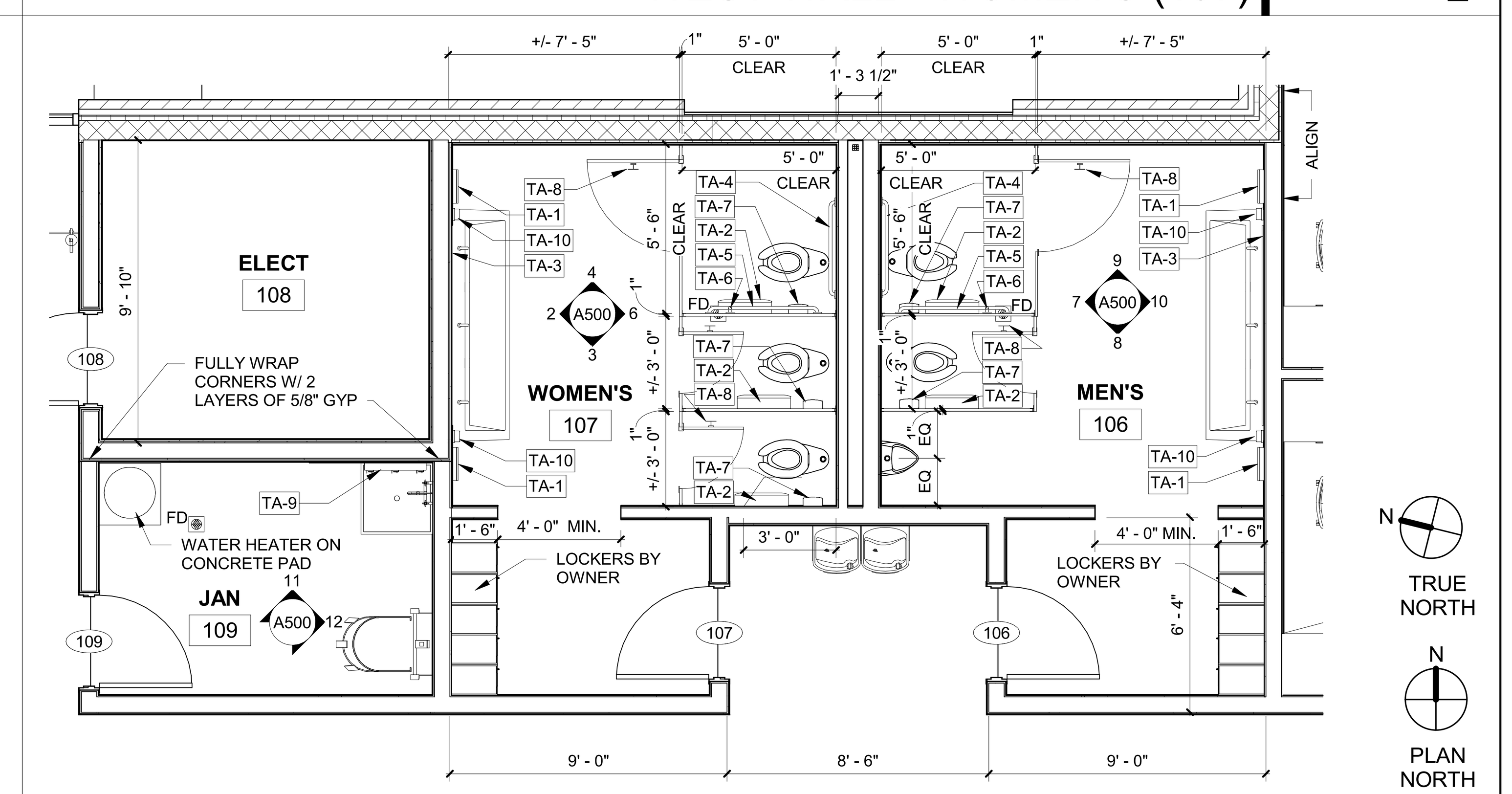


WEST WALL - WOMEN'S (107) 3/8" = 1'-0" 2



NOTE:
ALL MOUNTING DIMENSIONS ARE MEASURED FROM FINISHED SURFACES.

ADULT ADA MOUNTING HEIGHTS 3/8" = 1'-0" 5



ENLARGED TOILET PLAN 1/4" = 1'-0" 1

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NCCCS #2689

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HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 West Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

TOILET ELEVATIONS AND DETAILS

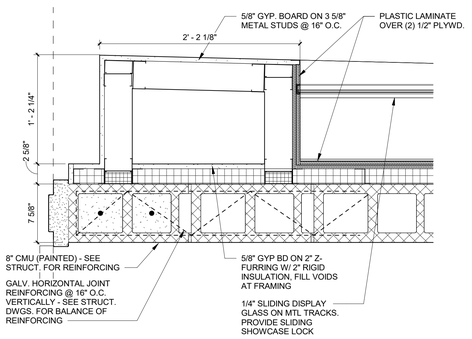
DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

3-3-2025

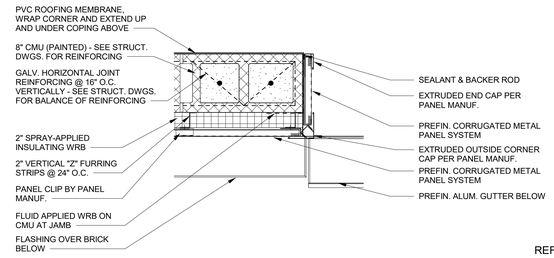
SHEET NUMBER

A500



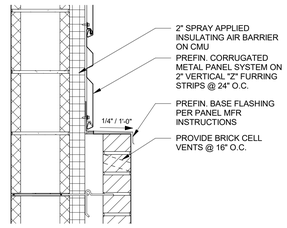
REF:1/A100

WEST END, DISPLAY WALL - CORR. (105) 1 1/2" = 1'-0" 11



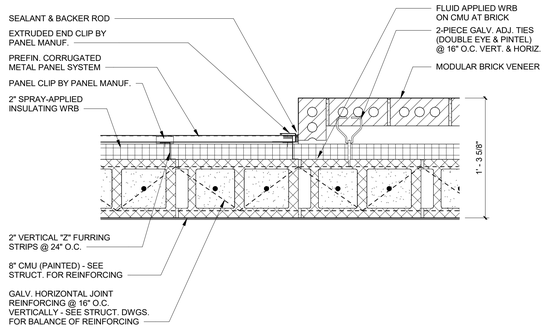
REF:1/A110

PLAN DETAIL AT PARAPET END 1 1/2" = 1'-0" 12



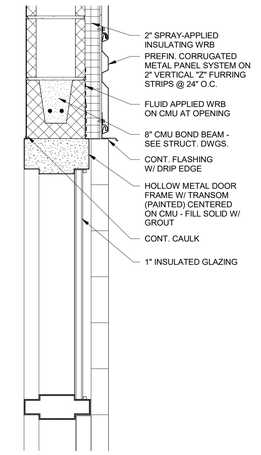
REF:1/A400

MTL PANEL OVER BRICK 1 1/2" = 1'-0" 9



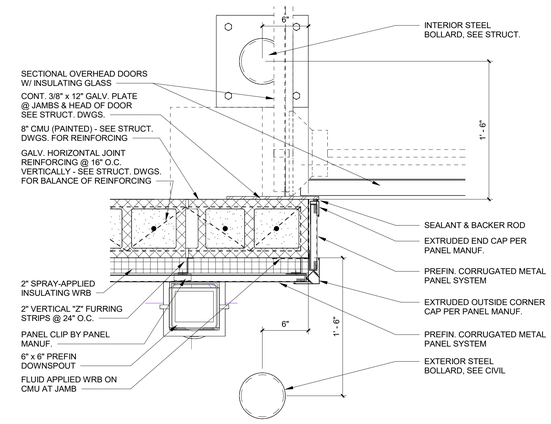
REF:1/A100

BRICK / MTL PANEL 1 1/2" = 1'-0" 6



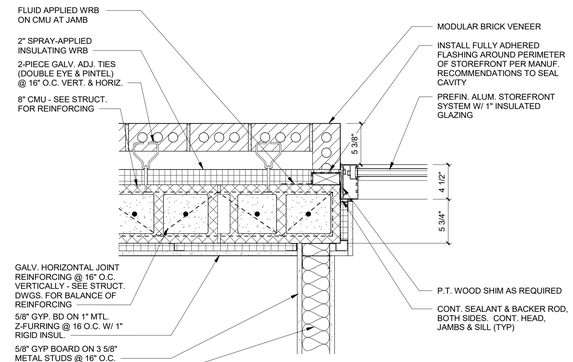
REF:1/A100

HEAD @ MTL PNL 1 1/2" = 1'-0" 3



REF:1/A100

OH DOOR JAMB 1 1/2" = 1'-0" 10



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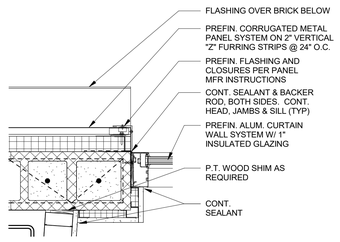
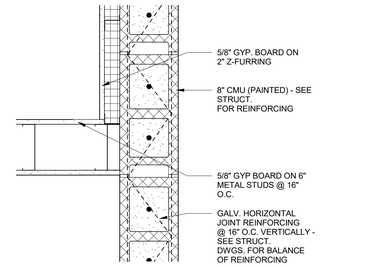
STOREFRONT JAMB AT BRICK 1 1/2" = 1'-0" 8



REF:2/A100

STOREFRONT JAMB AT MTL PANEL 1 1/2" = 1'-0" 5



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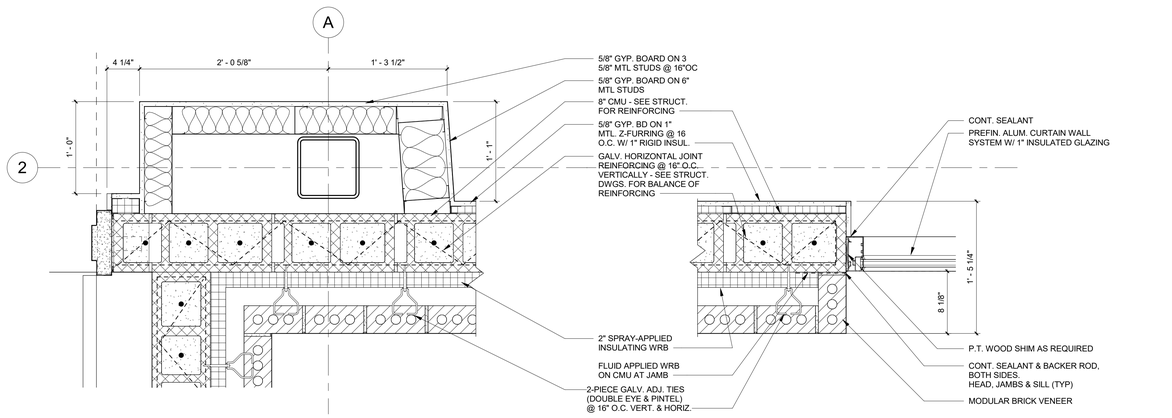
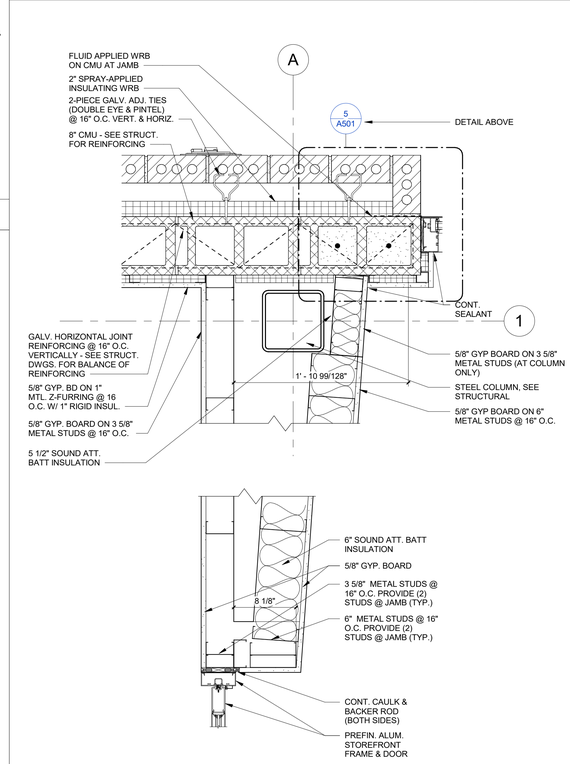
GYPSUM FURRING 1 1/2" = 1'-0" 2



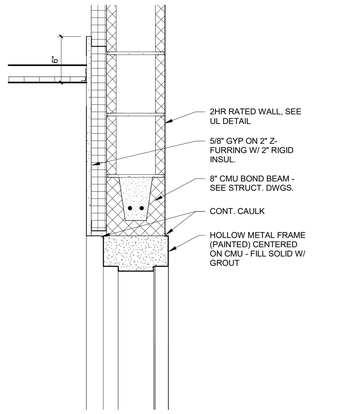
REF:1/A100

SOUTHEAST CORNER - LOBBY (101) 1 1/2" = 1'-0" 7



REF:1/A100

ANGLED WALL / SF - LOBBY (101) 1 1/2" = 1'-0" 4



REF:1/A100

INT. DOOR HEAD @ CMU 1 1/2" = 1'-0" 1

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BID DOCUMENTS

ENLARGED PLANS & DETAILS

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS

NO:	DATE:	DESCRIPTION:

3-3-2025

SHEET NUMBER

A501

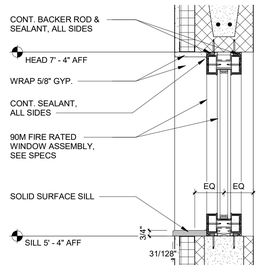
DOOR , FRAME AND HARDWARE SCHEDULE

DOOR #	ROOM NAME	DOOR TYPE	DOOR SIZE WIDTH	DOOR SIZE HEIGHT	DOOR MATERIAL	DOOR FINISH	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	FRAME HEAD	FRAME JAMB	HARDWARE THRESHOLD	HARDWARE CLOSER	HARDWARE PANIC	HARDWARE HW SET	RATING	REMARKS
101A	MAIN LOBBY	1	8' - 0"	8' - 0"	ALUM/GLASS	PREFINISHED	SF1	ALUM.	PREFIN.	N/A	N/A	YES	YES	—	15		
101B	MAIN LOBBY	1	3' - 0"	8' - 0"	ALUM/GLASS	PREFINISHED	SF3	ALUM.	PREFIN.	N/A	N/A	YES	YES	—	14		
102	ADMIN	1	3' - 0"	8' - 0"	ALUM/GLASS	PREFINISHED	A	ALUM.	PREFIN.	N/A	N/A	—	YES	—	02		
103	OFFICE	2	3' - 0"	7' - 0"	S.C. WOOD	STAINED	C	H.M.	PAINT	H1	J1	—	—	—	02		
104	OFFICE	2	3' - 0"	7' - 0"	S.C. WOOD	STAINED	C	H.M.	PAINT	H1	J1	—	—	—	02		
105	CORRIDOR	1	3' - 0"	8' - 0"	ALUM/GLASS	PREFINISHED	SF4	ALUM.	PREFIN.	N/A	4/A501	YES	YES	—	14		
106	MEN'S	4	3' - 0"	7' - 0"	S.C. WOOD	STAINED - D-1	A	H.M.	PAINT-P-1	H1	J1	—	YES	—	13		
107	WOMEN'S	4	3' - 0"	7' - 0"	S.C. WOOD	STAINED - D-1	A	H.M.	PAINT-P-1	H1	J1	—	YES	—	13		
108	ELECT	4	3' - 0"	7' - 0"	S.C. WOOD	STAINED - D-1	A	H.M.	PAINT-P-1	H1	J1	—	YES	—	12	90M	
109	JAN	4	3' - 0"	7' - 0"	S.C. WOOD	STAINED - D-1	A	H.M.	PAINT-P-1	H1	J1	—	—	—	04		
110A	AUTO SIM LAB A	2	3' - 0"	7' - 0"	S.C. WOOD	STAINED - D-1	A	H.M.	PAINT -P-1	H1	J1	—	—	—	03		
110B	AUTO SIM LAB B	2	3' - 0"	7' - 0"	S.C. WOOD	STAINED - D-1	A	H.M.	PAINT -P-1	H1	J1		—	—	03		
111A	AUTO SIM STORAGE	4	6' - 0"	8' - 0"	S.C. WOOD	STAINED - D-1	A	H.M.	PAINT -P-1	H1	J1	—	—	—	05		
111B	AUTO SIM STORAGE	4	6' - 0"	8' - 0"	S.C. WOOD	STAINED - D-1	A	H.M.	PAINT -P-1	H1	J1	—	—	—	05		
112	AUTO SIM LAB B	5	6' - 0"	8' - 0"	H.M.	PAINTED	B	H.M.	PAINT-P-1	5/A600	J2	—	YES	—	09	90M	
113	EQUIP STOR	5	6' - 0"	8' - 0"	H.M.	PAINTED	B	H.M.	PAINT-P-1	H2	J2	—	YES	—	10	90M	
114A	LIFT BAYS	3	3' - 0"	7' - 0"	H.M.	PAINTED	B	H.M.	PAINT-P-1	H2	J2	—	YES	—	07	90M	
114B	CORRIDOR	3	3' - 0"	7' - 0"	H.M.	PAINTED	B	H.M.	PAINT-P-1	H2	J2	—	YES	—	08	90M	
114C	LIFT BAYS	5	3' - 0"	7' - 0"	H.M.	PAINTED	C	H.M.	PAINT-P-1	3/A501	J2(SIM)	YES	YES	YES	11		
114D	LIFT BAYS	6	12' - 0"	10' - 0"	STL./GLASS	PREFINISHED	NA	STL.	PREFIN.	10/A501	1/A403	—	—	—	01		SECTIONAL OVERHEAD DOOR
114E	LIFT BAYS	6	12' - 0"	10' - 0"	STL./GLASS	PREFINISHED	NA	STL.	PREFIN.	10/A501	1/A403	—	—	—	01		SECTIONAL OVERHEAD DOOR
114F	LIFT BAYS	5	3' - 0"	7' - 0"	H.M.	PAINTED	C	H.M.	PAINT	3/A501	J2(SIM)	YES	YES	YES	11		
114G	LIFT BAYS	6	12' - 0"	10' - 0"	STL./GLASS	PREFINISHED	NA	STL.	PREFIN.	10/A501	1/A403	—	—	—	01		SECTIONAL OVERHEAD DOOR
114H	TOOLS	5	6' - 0"	7' - 0"	H.M.	PAINTED	A	H.M.	PAINT	H1	J1	—	—	—	06		

NOTES

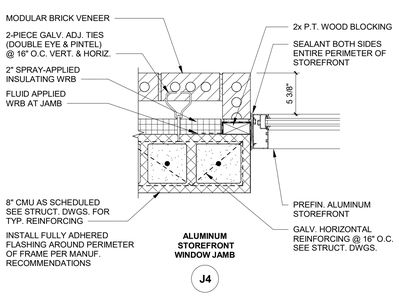
1. PROVIDE NON-REMOVABLE PINS AT EXTERIOR DOORS (U.N.O.).
2. CAULK CONT. AT INTERIOR & EXTERIOR PERIMETER FRAMES IN EXTERIOR WALLS.
3. PROVIDE SOFT FILLER MATERIAL INSIDE METAL FRAME TO ACCOMMODATE ATTACHMENT OF WEATHER STRIPPING & METAL DRIP.
4. ALL THRESHOLDS TO BE ADA COMPLIANT: THE FINISHED FLOOR ELEVATION ON BOTH SIDES OF A DOOR SHALL NOT BE MORE THAN 1/2" LOWER THAN THE THRESHOLD OF THE DOORWAY.
5. SEE STRUCTURAL DRAWINGS FOR REINFORCING AT DOOR HEADS.
6. FILL JAMB & HEADER STUDS W/ INSULATION (TYP. IN WALLS SCHEDULED TO RECEIVE INSULATION).
7. MAXIMUM DOOR OPENING EFFORTS (2018 NCSBC SECTION 1010.1.3):
   1. A 15 LB. FORCE SHALL RELEASE A LATCH
   2. A 30 LB. FORCE SHALL SET DOOR IN MOTION
   3. A 15 LB. FORCE SHALL SWING DOOR FULLY OPEN
   4. A 5 LB. FORCE FOR INTERIOR DOORS
8. ALL DOORS PROVIDED W/ LATCHING HARDWARE SHALL BE EQUIPPED W/ SINGLE-EFFORT, NON GRASP HARDWARE (IE LEVER - UNLESS PROVIDED W/ PANIC HARDWARE).
9. LEVER & PANIC HARDWARE SHOULD BE MOUNTED BETWEEN 34" & 48" ABOVE THE FINISH FLOOR.
10. ALL REQUIRED EXIT DOOR HARDWARE SHALL COMPLY WITH THE NCSBC & CHAPTER 10 OF THE NCSFC.
11. ALL EXTERIOR THRESHOLDS TO HAVE INTEGRAL WATER STOPS.
12. PANIC DEVICES AT RATED DOORS TO COMPLY WITH UL 10C AND 305.

DOOR SCHEDULE | 12" = 1'-0" | 3



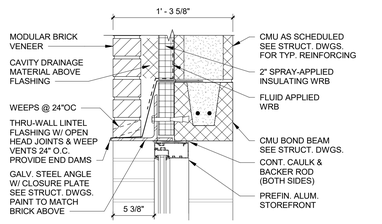
REF:3/A402

FIRE WINDOW SECT. | 1 1/2" = 1'-0" | 5



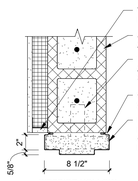
ALUMINUM STOREFRONT WINDOW JAMB

J4



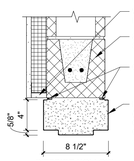
ALUMINUM STOREFRONT WINDOW HEAD

H4



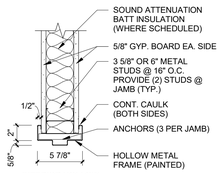
INTERIOR HOLLOW METAL DOOR JAMB

J2



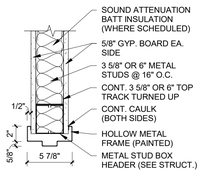
INTERIOR HOLLOW METAL DOOR HEAD

H2



INTERIOR HOLLOW METAL DOOR JAMB

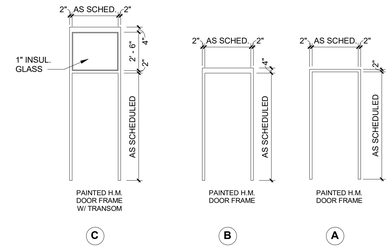
J1



INTERIOR HOLLOW METAL DOOR HEAD

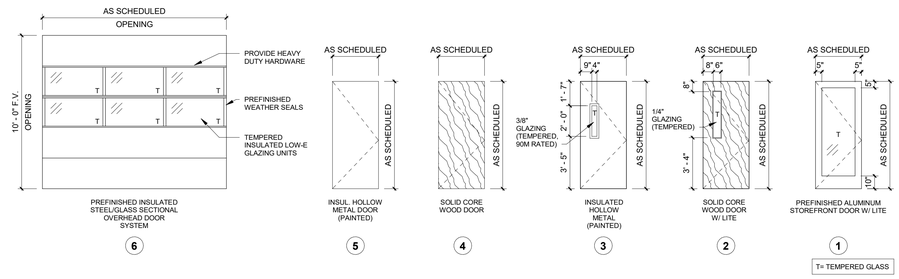
H1

HEAD & JAMB DETAILS | 1 1/2" = 1'-0" | 4



C B A

DOOR FRAME ELEVATIONS | 1/4" = 1'-0" | 2



6 5 4 3 2 1

DOOR ELEVATIONS | 1/4" = 1'-0" | 1

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BID DOCUMENTS

DOOR SCHEDULE AND TYPES

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS

NO: DATE: DESCRIPTION:

3-3-2025

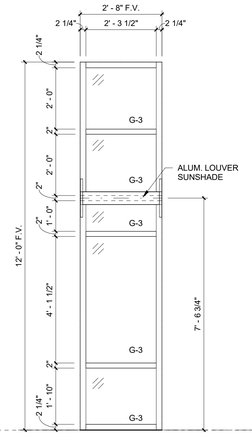
SHEET NUMBER

A600

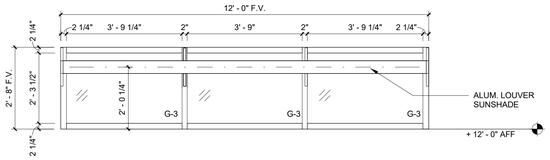
GLAZING LEGEND:	
G-1	120 MINUTE RATED FIRE-RESISTIVE GLASS 3/8" THICK
G-2	LOW-E TINTED TEMPERED INSULATED GLASS 1" THICK
G-3	LOW-E TINTED INSULATING GLASS 1" THICK
G-4	SPANDREL INSULATING GLASS 1" THICK

GLAZING NOTES:

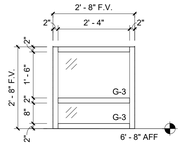
1. FIELD VERIFY ALL OPENINGS PRIOR TO ANY FABRICATION AND NOTIFY THE ARCHITECT OF ANY DISREPANCIES
2. SEE SPECIFICATIONS FOR MORE INFORMATION



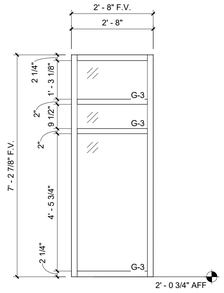
SF10



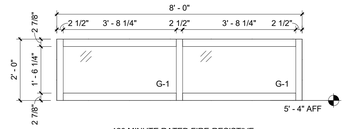
SF9



SF8



SF7

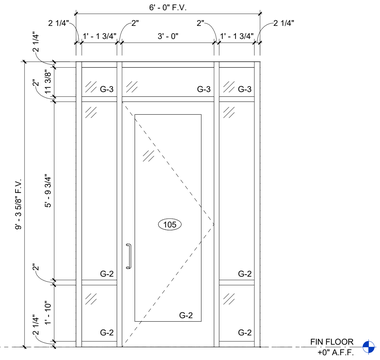


120 MINUTE RATED FIRE-RESISTIVE WINDOW ASSEMBLY, SEE SPECS

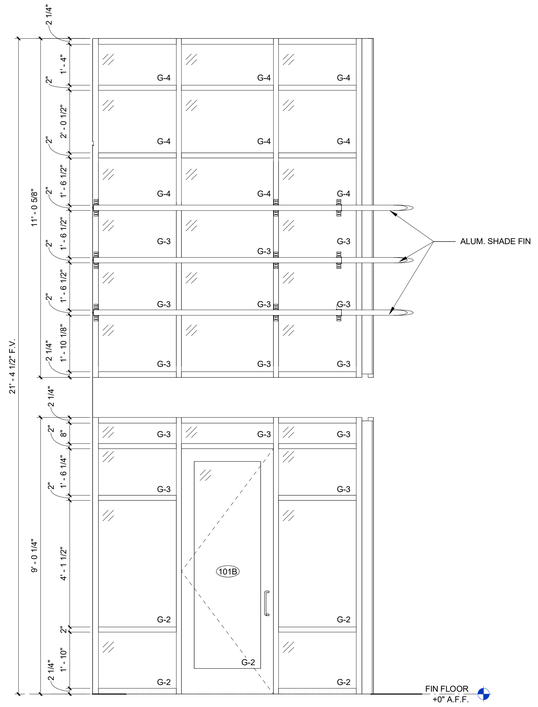
FW1

120 MINUTE RATED FIRE-RESISTIVE WINDOW ASSEMBLY, SEE SPECS

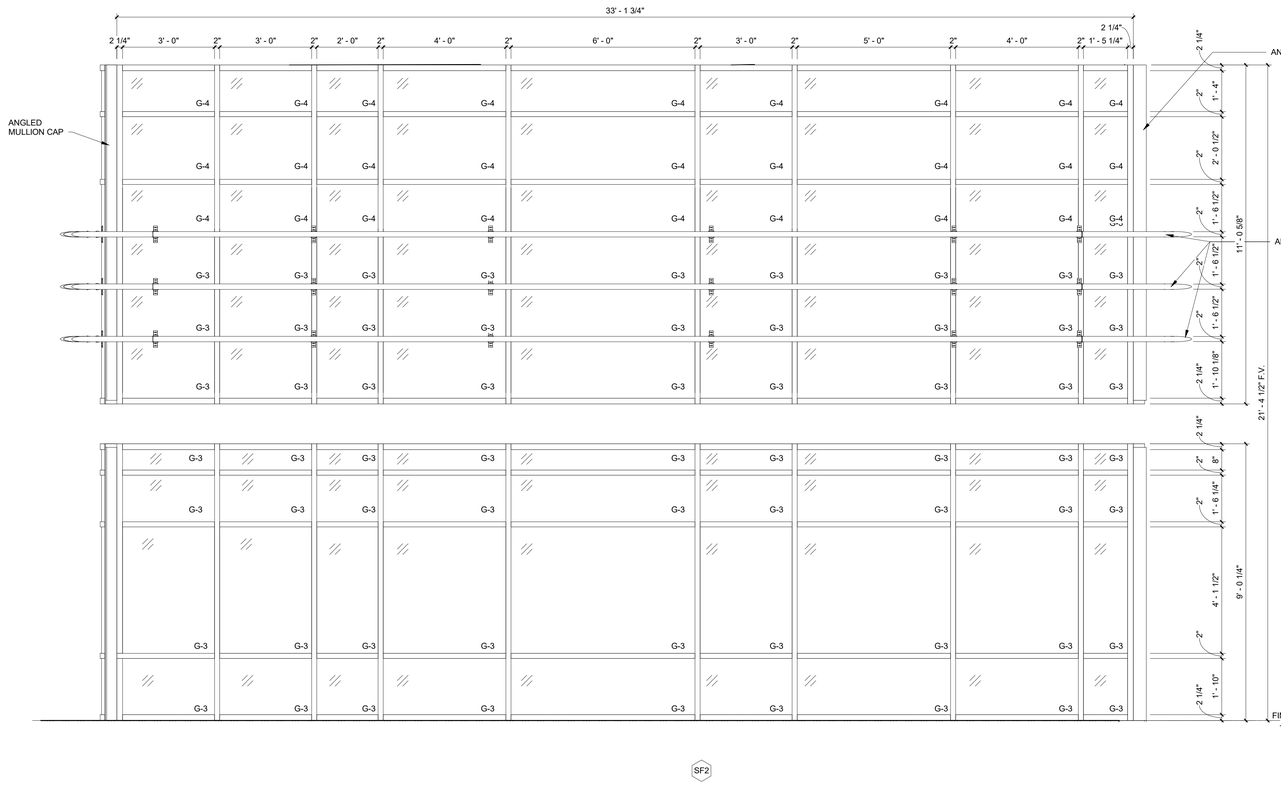
FW2



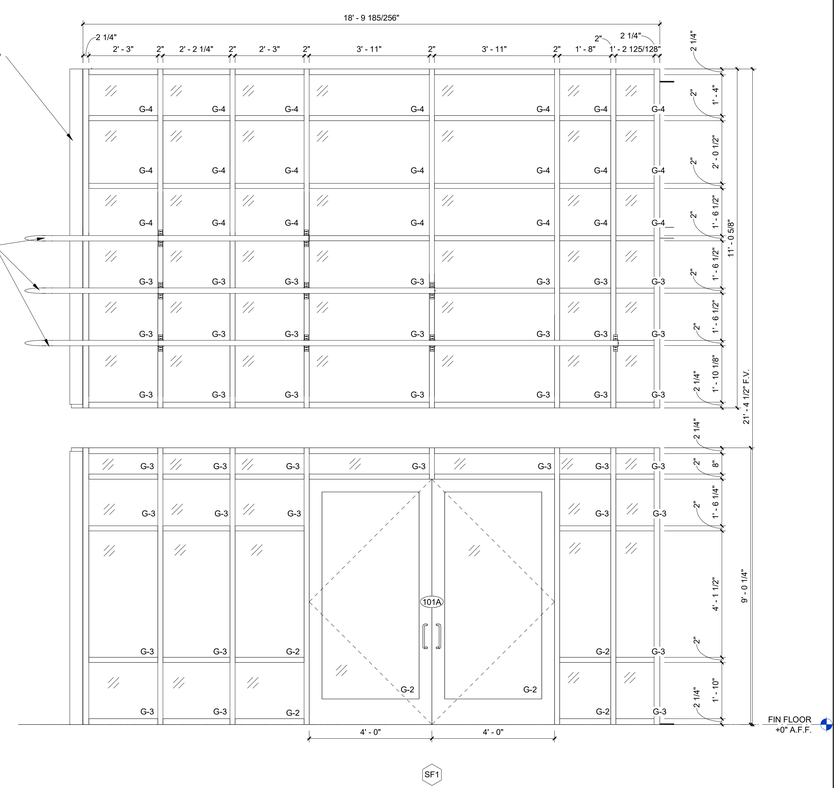
SF4



SF3



SF2



SF1

STOREFRONT ELEVATIONS | 1/2" = 1'-0" | 1

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STOREFRONT ELEVATIONS

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

3-3-2025

SHEET NUMBER

A601

INTERIOR FINISH LEGEND

ALL MATERIALS ARE BASIS OF DESIGN, SEE SPECIFICATIONS FOR APPROVED EQUALS.

FINISH CODE	MANUFACTURER	PRODUCT NAME	PRODUCT NUMBER	COLOR	SIZE / WIDTH	DESCRIPTION	REMARKS
BASE							
B-1	ROPPE	PROFILE RUBBER BASE	670	ASPHALT	6" H	COVE BASE	SEE SPECIFICATION 09 65 19
B-2	FLORIDA TILE	DIVINITY	P43C9-AT	DAWN	3" x 24"	UNPOLISHED PORCELAIN FLOOR, BULLNOSE	GR-1, TR-1 @ FLOOR TO WALL TRANSITION
FLOORING							
CPT-1	SHAW CARPET	CROSS WEAVE TILE	5T526	VIBRANT MOLE 25485	18" X 36"	CARPET - TILE	INSTALLATION DIRECTION - ASHLAR
VET-1	PATCRAFT	ADMIX	1508V	SOAR 00437	18" X 36"	VINYL ENHANCED TILES	INSTALLATION DIRECTION - MONOLITHIC / GRID
SVT-1	KAHRS	QUARTZ LINES	8202	CONGLOMERATE GRAY	12" x 24"	HOMOGENEOUS QUARTZ VINYL TILE	INSTALLATION DIRECTION - MONOLITHIC / GRID
SVT-2	KAHRS	QUARTZ LINES	8257	BLUE	12" x 24"	HOMOGENEOUS QUARTZ VINYL TILE	INSTALLATION DIRECTION - MONOLITHIC / GRID
SC-1	SEE SPECIFICATION	SEALED CONCRETE	-	-	-	-	SEE SPECIFICATION 03 30 00
PT-1	FLORIDA TILES	DIVINITY	FTIDIV10112X24	DAWN	12" x 24"	UNPOLISHED PORCELAIN FLOOR TILE	GR-2 , SEE SPECS 09 30 00
WALLS							
P-1	PPG PAINTS	TRIM PAINT	PPG0998-4	SHADOWY	SEMI-GLOSS	TRIM AND HANDRAIL PAINT	SEE SPECIFICATION 09 91 00
P-2	SHERWIN WILLIAM	STANDARD PAINT	SW7671	ON THE ROCKS	EG SHEL	STANDARD WALL PAINT	SEE FINISH SCHEDULE, SEE SPECIFICATION 09 91 00
P-3	PPG PAINTS	ACCENT PAINT	PPG1158-7	STUNNING SAPPHIRE	EG SHEL	ACCENT WALL, HENDRIK LOGO: (RGB - 0, 85,140)	COLOR FOR SIGNAGE
P-4	PPG PAINTS	ACCENT PAINT	PPG 1155-7	BLUE LAVA	EG SHEL	ACCENT WALL, WALL (GRAPHICS-DARK BLUE)	SEE SPECIFICATION 09 91 00 AND COLOR FOR SIGNAGE
P-5	PPG PAINTS	ACCENT PAINT	PPG1236-6	JAMAICAN SEA	-	ACCENT WALL (GRAPHICS-LIGHT BLUE)	SEE SPECIFICATION 09 91 00 AND COLOR FOR SIGNAGE
P-6	PPG PAINTS	ACCENT PAINT	PPG 1010-6	UP IN SMOKE	EG SHEL	ACCENT WALL (GRAPHICS- GRAY)	SEE SPECIFICATION 09 91 00 AND COLOR FOR SIGNAGE
P-7	PPG PAINT	ACCENT PAINT	PPG0998-6	ON THE EDGE	EG SHEL	ACCENT WALL	SEE SPECIFICATION 09 91 00
P-8	SHERWIN WILLIAM	EPOXY PAINT	SW7671	ON THE ROCKS	EPOXY	TOILET PAINT (EPOXY)	SEE FINISH SCHEDULE, EPOXY PAINT
P-9	SHERWIN WILLIAM	CEILING PAINT	SW7757	HIGH REFLECTIVE WHITE	FLAT	CEILING PAINT	SEE SPECIFICATION 09 91 00
WT-1	FLORIDA TILE	WALL TILE - AVENTIS	FTIAT3RF12X24	TITANIUM	12" X 24"	PORCELAIN WALL TILE	GR-1, SEE SPECS 09 30 00
SURFACES							
PL-1	WILSONART	PLASTIC LAMINATE	5058K-18	TITAIUM ALLOY (LINEARITY FINISH)	4'X8'	COUNTER TOP SUPPORT	SEE SPECIFICATION AND A701 FOR INTERIOR ELEV.
QTZ-1	BRADLEY - EVERO	CAST FORMEDI | NAT QUARTZ	GEO SERIES	ANTARCTICA	1/2" THK.	PERFORMED LAVATORY COUNTER TOP SYSTEM BY BREADLEY CORP.	SEE SPECIFICATION 12 36 61
SSF-1	WILSONART	SOLID SURFACE	9116GS	SMOOTH GRAY	3/4" THK.	WINDOW SILLS, COUNTERTOPS	SEE SPECIFICATION 06 22 00
SS-1	CONTRACTOR'S CHOICE	STAINLESS STEEL	-	BRUSHED FINISH	14 GA.	COUNTER TOP	SEE SEPCIFICATION AND INTERIOR ELEV. 3/A701, 4/A701
MISCELLANEOUS							
CG-1	CS-ACROVYN	CORNER GUARD	CO-8	STAINLESS STEEL		-	SEE SPECIFICATION 10-26-13, SEE A701
FRP-1	CRANE COMPOSITES	VERIETEX	SATIN SANDSTONE TEXTURE	PEPPER DUST 8044	.09" (4'X10')	FRP PANELS, SANITARY WALL PANELS W ALL TRIM PIECES	SEE SPECIFICATION 09-98-60, SEE A701
GR-1	LATICRETE	SPECTRALOCK PREMIX	33109-0001-2	60 DUSTY GREY	-	EPOXY WALL GROUT	SEE SPECIFICATION 09 30 00
GR-2	LATICRETE	SPECTRALOCK PRO PREMIUM	#1267-0409-2	60 DUSTY GREY		EPOXY FLOOR GROUT	SEE SPECIFICATION 09 30 00
D-1	MASONITE	DOOR STAIN	WHITE MAPLE	STAIN - COCOA BEAN	PLAIN SLICE	-	-
MB-1	CLARIDGE PROD & EQIP	WHITE MARKER BOARD	N/A	WHITE W/ALUM.FRAME	4 ' H X 8' L	PORCELAIN STEEL WHITEBOARD	SEE SPECIFICATION 10 11 00, SEE FINISH PLAN A701 FOR LOCATION
TP-1	ASI GLOBAL PARTITION	SOLID PLASTIC	#9509	BLUE	-	TOILET PARTITION	SEE SPECIFICATION 10 2113
TR-1	SCHULTER	COVE TRANSITION	DILEX-AHX	STAINLESS STEEL	SIZE APPROPRIATELY	TRANSITION - FLOOR TO WALL TILES	1/A705
TR-2	KUBERIT	METAL EDGE	KT-D-025-C	A1, ANODIZED ALUMINIUM	SIZE APPROPRIATELY	TRANSITION - CARPET TO RESILIENT	2/A705
TR-3	DALTILE	THRESHOLD	DOUBLE BEVEL	CARRA WHITE M701	4" x 36" x 5/8"	ADA COMPLIENT THRESHOLD	SEE SPECIFICATION 09 30 00
TR-4	SCHULTER	EDGE CAP OF WALL TILE	JOLLY	STAINLESS STEEL	SIZE APPROPRIATELY	TRANSITION - EDGE CAP	4/A705
TR-5	KUBERIT	EDGE TRIM	KT- F- 030-C	A1, ANODIZED ALUMINIUM	1/8"	TRANSITION- RESILIENT TO CONCRETE (SEALED AND POLISHED)	5/A705
TR-6	KUBERIT	SVT TO RESILIENT	KT- I - 030-S	A1, ANODIZED ALUMINIUM	1-3/16"	TRANSITION - VET TO SVT	-
WC-1	MECHO SHADES	SOHO (5% OPENNESS)	1900 SERIES	DOVE GREY 1905	-	MANUALLY OPERATED SOLAR ROLLER SHADES	SEE SPECIFICATION 12 24 00

ROOM FINISH SCHEDULE

RM NO.	NAME	FLOOR	BASE	WALLS		MILLWORK - CABINETS		COMMENTS
				STANDARD WALL	ACCENT WALL	COUNTE RTOP	FRONT	
101	MAIN LOBBY	VET-1	B-1	P-2	P-4, P-5, P-6			
102	ADMIN	CPT-1	B-1	P-2	P-7			
103	OFFICE	CPT-1	B-1	P-2	P-7			
104	OFFICE	CPT-1	B-1	P-2	P-7			
105	CORRIDOR	VET-1	B-1	P-2				
106	MEN'S	PT-1	B-2	P-8 / WT-1		QTZ-1		PORCELAIN TILE UP TO FIN. CEILING ON WET WALLS, SEE ELEVATIONS
107	WOMEN'S	PT-1	B-2	P-8 / WT-1		QTZ-1		PORCELAIN TILE UP TO FIN. CEILING ON WET WALLS, SEE ELEVATIONS
108	ELECT	SC-1	B-1	P-2				
109	JAN	SC-1	B-1	P-8/FRP-1				
110	AUTO SIM LAB A	SVT-1/SVT-2	B-1	P-2	MB-1			
111	AUTO SIM STORAGE	SC-1	B-1	P-8				
112	AUTO SIM LAB B	SVT-1/SVT-2	B-1	P-2				
113	EQUIP STOR	SC-1	B-1	P-8	MB-1			
114	LIFT BAYS	SC-1	B-1	P-8				
115	TOOLS	SC-1	B-1	P-8				

INTERIOR FINISH GENERAL NOTES

1. REFER TO OR REFERENCE INTERIOR SECTIONS, ELEVATIONS, DETAILS AND REFLECTED CEILING PLANS FOR ADDITIONAL INFORMATION (SEE COVER SHEET INDEX AND/OR SHEET SERIES).
2. VERIFY LOCATION OF CONTROL JOINTS IN ROOMS RECEIVING TILE FLOORS. SEE WRITTEN SPECIFICATIONS **SECTION # 09 30 00.**
3. ALL INTERIOR WALL & CEILING FINISHES SHALL COMPLY WITH ***NCSBC CHAPTER 8, SECTION 803, TABLE 803.11***

   NONSPRINKLERED:.
   A. INTERIOR EXIT STAIRWAYS, RAMPS AND EXIT PASSAGEWAYS: ***CLASS A***
   B. CORRIDORS & ENCLOSURES FOR EXIT ACCESS STAIRWAYS AND RAMPS: ***CLASS A***
   C. ROOM AND ENCLOSED SPACES ***CLASS C***
4. INTERIOR FLOOR FINISHES COMPLY WITH ***NCSBC CHAPTER 8***, ***SECTION 804***
5. ALL INTERIOR FINISHES IN TOILET AND BATHROOMS SHALL COMPLY WITH ***NCSBC CHAPTER 12, SECTION 1210.2, 1210.2.1 THROUGH 1210.2.4.***
6. REFER TO DOOR SCHEDULE (A600 SERIES) FOR DOOR & FRAME FINISHES.
7. FOR MISCELLANEOUS INTERIOR TRIM FINISHES (WALL CAPS, RAILINGS, SILLS, ETC. SEE REMARKS COLUMN IN ROOM FINISH SCHEDULE. ELEMENTS SUCH AS GRILLE AND LOUVER COLORS TO MATCH ADJACENT WALL OR CEILING PAINT COLOR UNLESS OTHERWISE NOTED.

INTERIOR FINISH CODES

ACT	ACOUSTICAL CEILING TILE	QT	QUARRY TILE
AWC	ACOUSTICAL WALL CARPET	QTZ	QUARTZ
AWP	ACOUSTICAL WALL PANEL FINISH	RC	RESINOUS COUNTER
B	BASE	RF	RUBBER FLOOR
BRK	BRICK VENEER	RP	RESIN PANEL
CC	COLUMN COVER	SC	SEALED CONCRETE
CG	CORNER GUARD	SSF	SOLID SURFACE
CR	CHAIR RAIL	SS	STAINLESS STEEL
CPT	CARPET (TILES, BROADLOOM, WALKOFF)	ST	STAIN
CRT	CURTAIN (SHOWER, STAGE)	STC	STAINED CONCRETE
CSM	CAST STONE MASONRY	SDT	STATIC DISSIPATIVE TILE
D	DOOR	STR	STAIR TREAD
ELV	ELEVATOR FINISHES	TB	TACK BOARD
EPF	EPOXY FLOOR SYSTEM FINISH	TP	TOILET PARTITION
EPW	EPOXY WALL SYSTEM FINISH	TR	TRANSITIONS (FLOOR/WALL)
FRP	FIBERGLASS REINFORCED PANEL	TZ	TERRAZZO
FLM	FILM PRODUCT	VCT	VINYL COMPOSITION TILE
GL	GLASS	VET	VINYL ENHANCED TILE
GR	GROUT	VS	VINYL SHEET FLOORING
LCK	LOCKERS	VWC	VINYL WALLCOVERING
LV	LUXURY VINYL (TILE, PLANK)	WP	WALL PROTECTION
MB	MARKER BOARD/ GLASS BOARD	WC	WINDOW COVERING
N	NOSING (WOOD, RUBBER, METAL)		(BLINDS, SOLAR ROLLER SHADE, DRAPES)
OWP	OPERABLE WALL PARTITION	WT	WALL TILE
P	PAINT	WPS	WALL PANEL SYSTEM
PC	POLISHED CONCRETE	WFS	WOOD FLOOR SYSTEM
PL	PLASTIC LAMINATE		
PT	PORCELAIN TILE		

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BID DOCUMENTS

FINISH LEGEND, SCHEDULE, NOTES & CODES

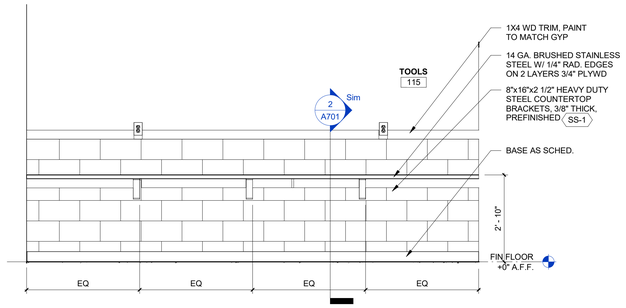
DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

3-3-2025

SHEET NUMBER

A700



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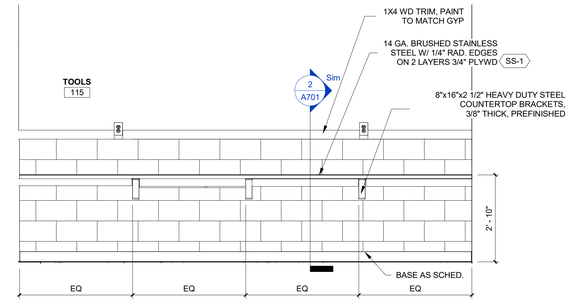
COUNTER @ TOOLS-EAST 1/2" = 1'-0" 3



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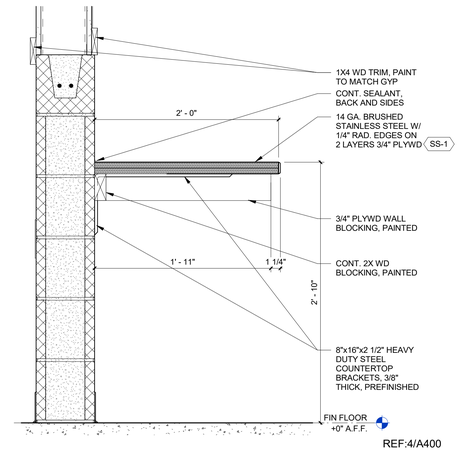
COUNTER @ TOOLS-WEST 1/2" = 1'-0" 4



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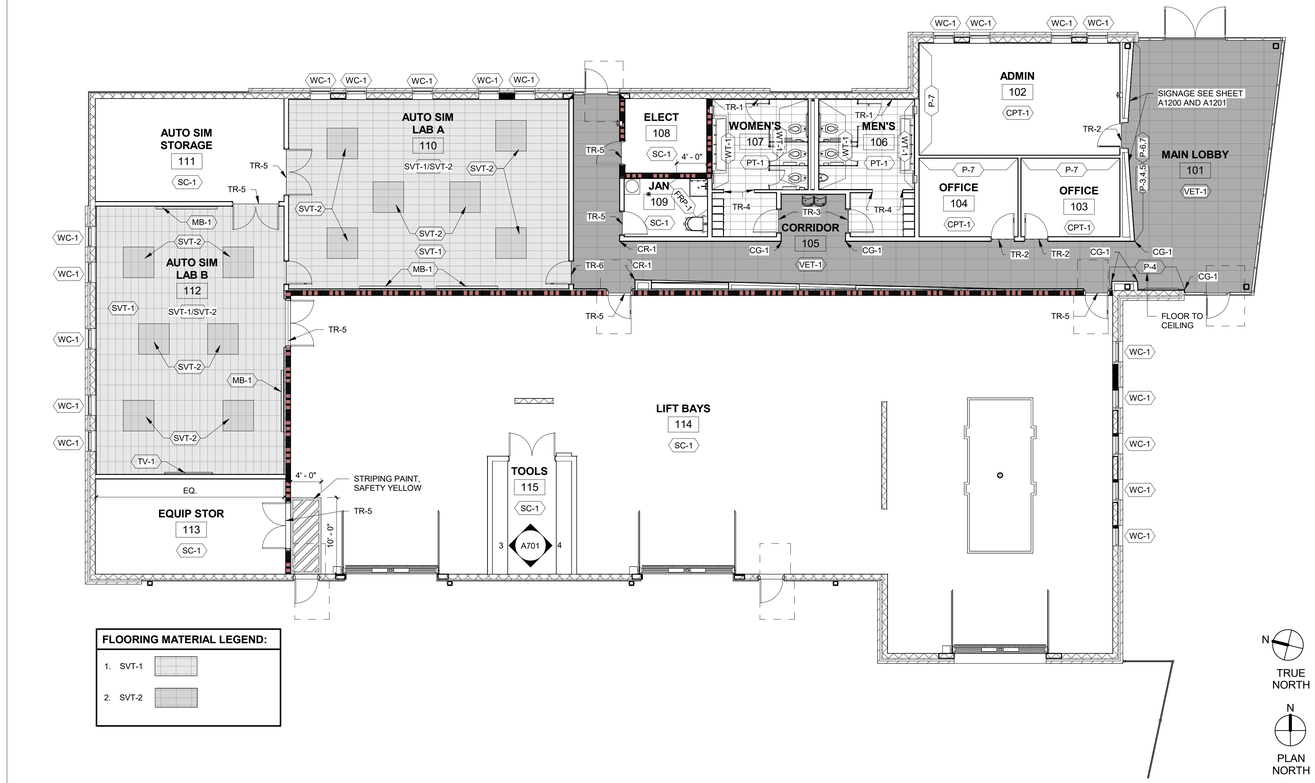
SECTION AT TOOL ROOM COUNTER 1 1/2" = 1'-0" 2



OVERALL FIRST FLOOR FINISH PLAN 1/8" = 1'-0" 1

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FIRST FLOOR FINISH PLAN

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS

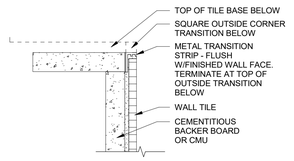
NO:	DATE:	DESCRIPTION:

3-3-2025

SHEET NUMBER

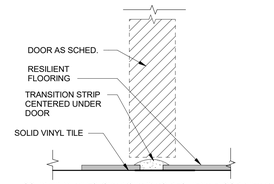
A701

WALLS



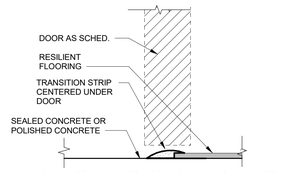
TR-4

FLOORS & COVE



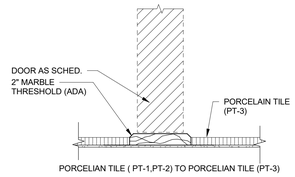
SOLID VINYL TILES (SVT-1/SVT-2) TO RESILIENT FLOOR (VET-1)

TR-#6



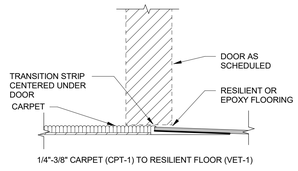
SEALED CONRETE FLOOR (SC-1/PC-1) TO RESILIENT FLOOR (VET-1) / SOLID VINYL TILE (SVT-1 / SVT-2)

TR-#5



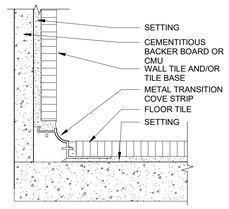
PORCELIAN TILE (PT-1,PT-2) TO PORCELIAN TILE (PT-3)

TR-#3



1/4"-3/8" CARPET (CPT-1) TO RESILIENT FLOOR (VET-1)

TR-#2



METAL COVE TRANSITION, TILE (PT-1) TO TILE (WT-1)

TR-#1

TRANSITION DETAILS

6" = 1'-0"

1

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TRANSITIONS & DETAILS

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A705

REFLECTED CEILING PLAN SYMBOL LEGEND

Symbol	Description
CEILING TAG (00 / 9'-0")	CEILING TYPE; CEILING HEIGHT-FROM FINISH FLOOR (UNO)
	2'x2' LED TROFFER LIGHT FIXTURE
	SUSPENDED LED HI-BAY PENDANT LIGHT FIXTURE
	RECESSED LED LIGHT FIXTURE
	SUSPENDED LED PENDANT LIGHT FIXTURE
	EXTERIOR WALL MOUNTED LED EMERGENCY LIGHT FIXTURE
	RECESSED LED LINEAR LIGHT FIXTURE
	WALL MOUNTED LED LINEAR LIGHT FIXTURE
	EXIT LIGHT-WALL MOUNTED
	EXIT LIGHT-CEILING MOUNTED
	HVAC SUPPLY DIFFUSER
	HVAC RECESSED, LINEAR SUPPLY DIFFUSER
	HVAC RETURN DIFFUSER
	HVAC EXHAUST GRILLS
	WALL-MOUNTED SECURITY CAMERA

NOTE: SEE ELECTRICAL DRAWINGS FOR LIGHTING AND SECURITY FIXTURES. SEE MECHANICAL DRAWINGS FOR AIR TERMINALS.

GENERAL NOTES:

1.) ALL CEILING HEIGHTS ARE RELATIVE TO FINISH FLOOR ELEVATION IN THAT ROOM U.N.O.

2.) SEE ELECTRICAL DRAWINGS FOR LOCATION OF ALL EMERGENCY LIGHTS, NIGHT LIGHTS, EXIT SIGNS, HORNS, STROBES, & PULL STATIONS

3.) ALL LIGHT FIXTURES, SPEAKERS, ECT. IN CEILING TYPES ARE TO MATCH CEILING FINISH COLOR U.N.O.

4.) THE SPRINKLER HEAD LOCATIONS ARE SHOWN ON THIS DRAWING FOR REFERENCE-SEE SPRINKLER HEAD SHOP DRAWINGS

5.) ALL CEILINGS ARE TO BE INSTALLED AS REQUIRED BY ASCE 7-05 CHAPTER 13 SEISMIC DESIGN FOR NONSTRUCTURAL COMPONENTS

6.) ALL GYPSUM BOARD BULKHEADS TO BE AT 6" BELOW LOWEST ADJACENT CEILING U.N.O.

7.) *(provide the following as an option for projects of seismic design category 'D', 'E', or 'F'– consult your structural engineer)* ALL CEILINGS ARE TO BE CONSTRUCTED AS REQUIRED BY ASCE 7 CHAPTER 13 AND ANCHORED PER NCSBC SECTION 1613

CEILING TYPES:

TYPE #1: 24"x24"x5/8" LAY-IN ACOUSTICAL CEILING - WHITE w/ WHITE ALUM GRID

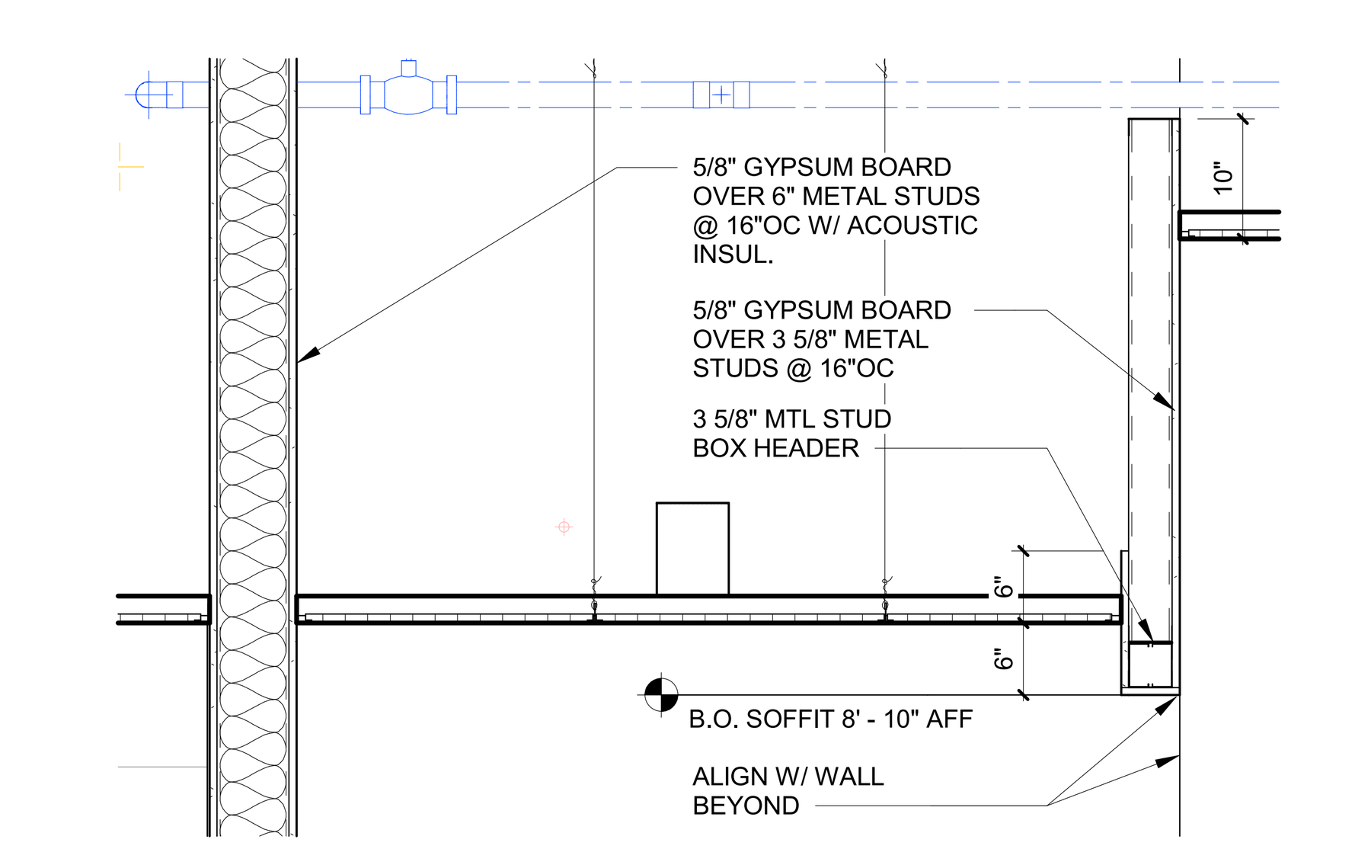
TYPE #2: 24"x24"x5/8" LAY-IN ACOUSTICAL CEILING (VINYL COATED)- WHITE w/ WHITE ALUM GRID

TYPE #3: GYPSUM BOARD CEILING/SOFFIT - PAINTED (PROVIDE MOIST. RESIST. GYP. BD AND EPOXY PAINT AT ALL WET LOCATIONS U.N.O)

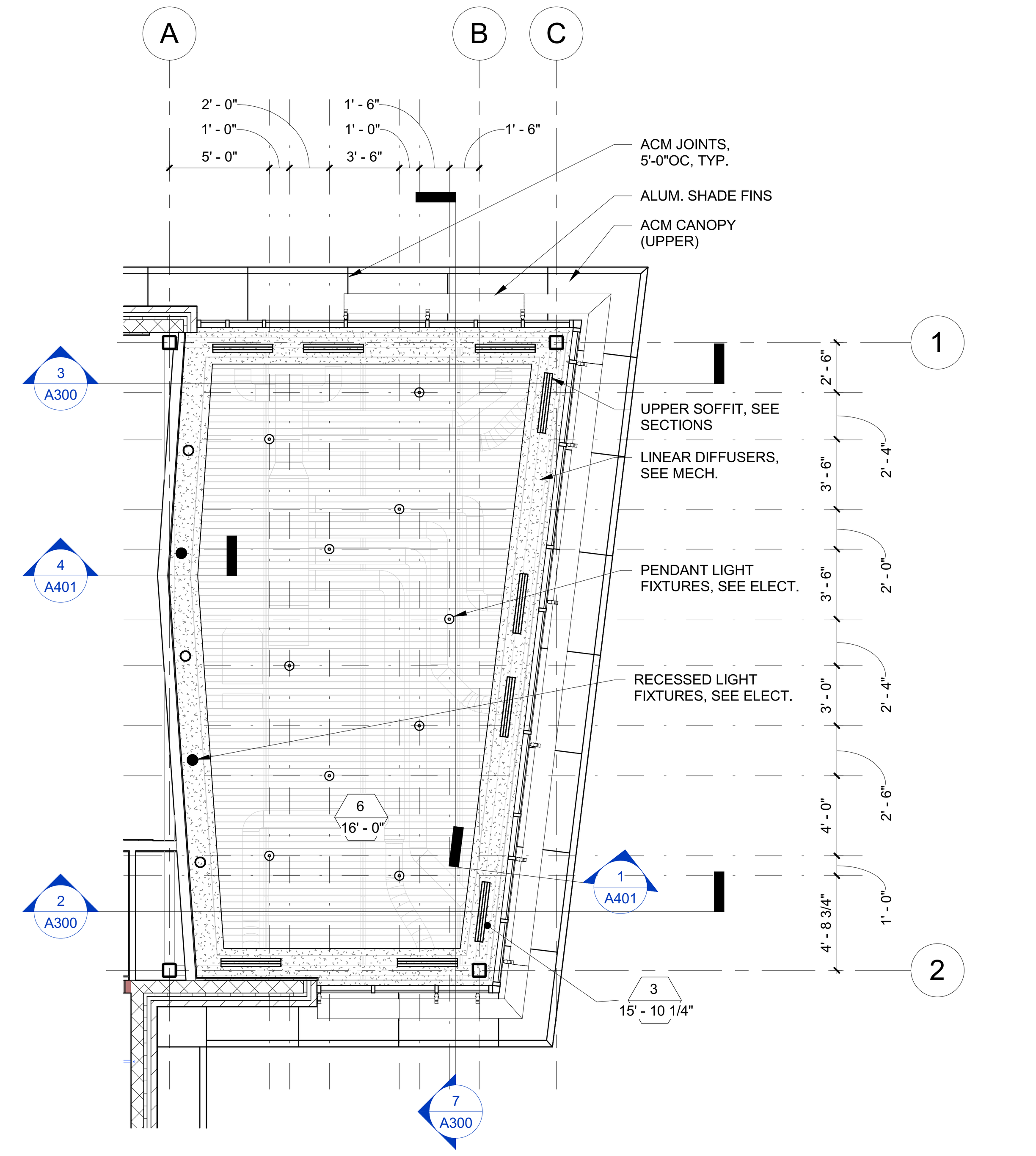
TYPE #4: OPEN TO STRUCTURE - PAINTED

TYPE #5: OPEN TO STRUCTURE - NOT PAINTED

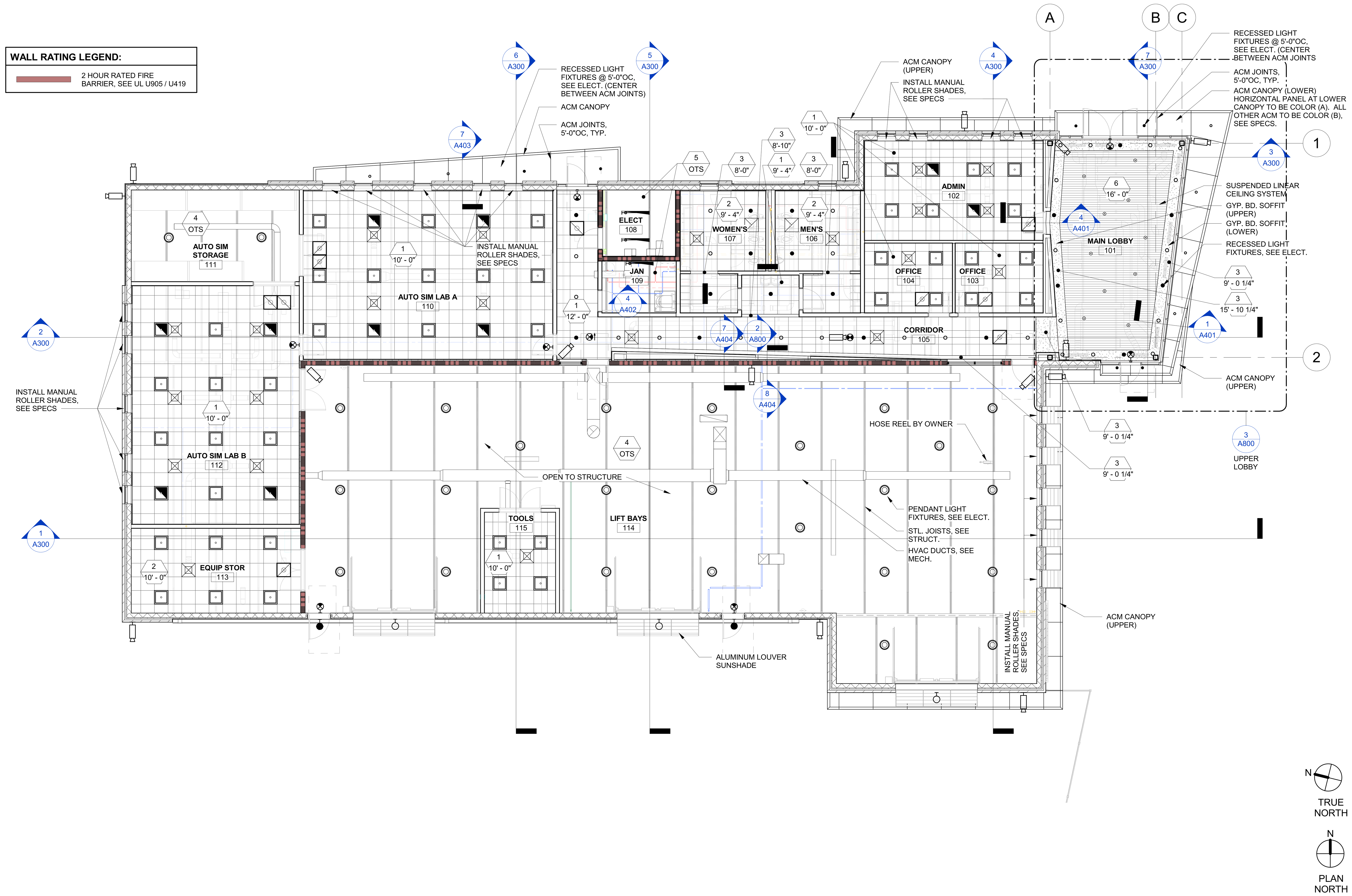
TYPE #6: SUSPENDED LINEAR CEILING SYSTEM. WOOD SLAT FINISH.



TOILET ROOM BULKHEAD 3/4" = 1'-0" 2



UPPER SOFFIT REFLECTED CEILING PLAN 3/16" = 1'-0" 3



REFLECTED CEILING PLAN 1/8" = 1'-0" 1

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REFLECTED CEILING PLAN & DETAILS

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REVISIONS

NO: DATE: DESCRIPTION:

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SEAL 50223

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A800

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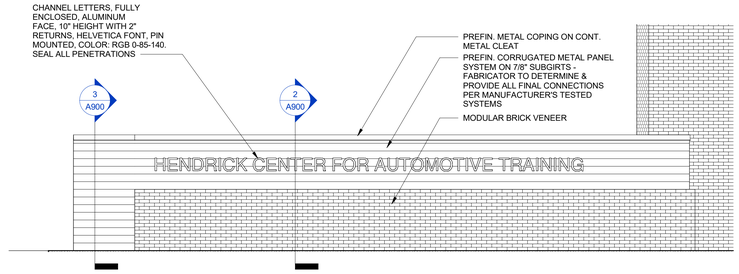
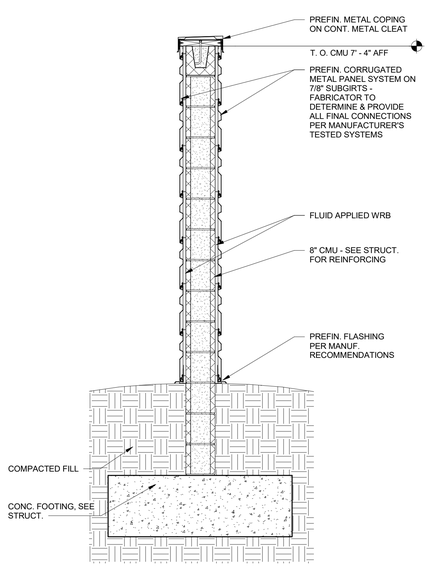
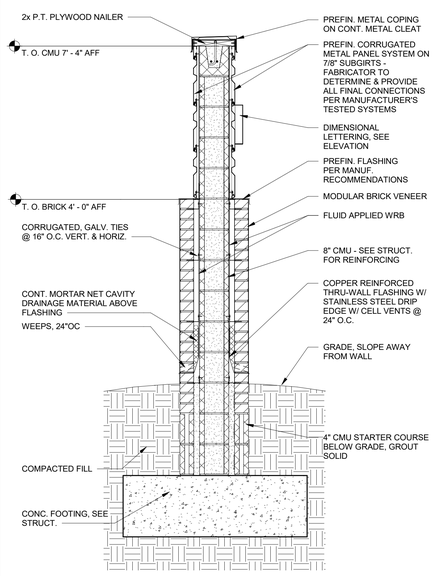


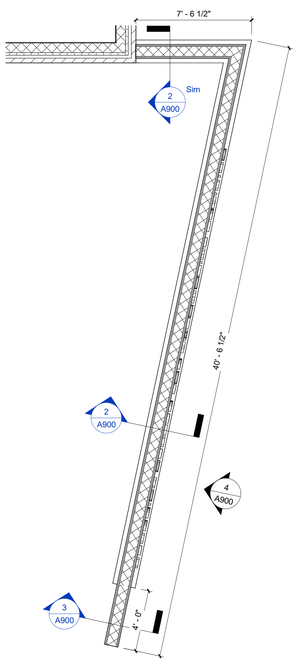
SCREEN WALL ELEV (ALT4) 1/4" = 1'-0" 4



SECT @ SCREEN WALL END (ALT4) 3/4" = 1'-0" 3



SECT @ SCREEN WALL (ALT4) 3/4" = 1'-0" 2



SCREEN WALL PLAN (ALT4) 1/4" = 1'-0" 1

RICHMOND COMMUNITY COLLEGE

HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 West Hamlet Ave,
Hamlet, NC 28345

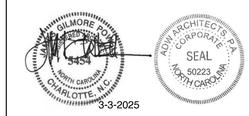
BID DOCUMENTS

ALTERNATES

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS

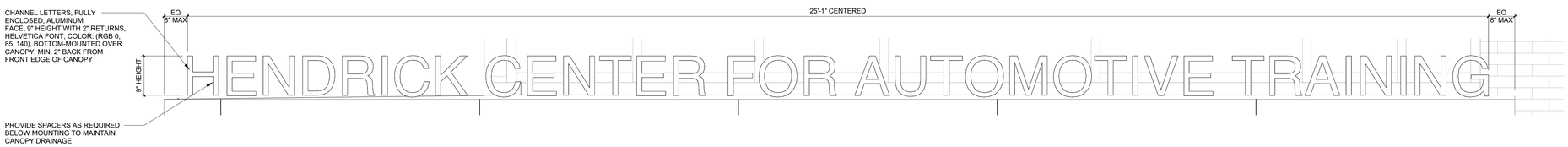
NO:	DATE:	DESCRIPTION:



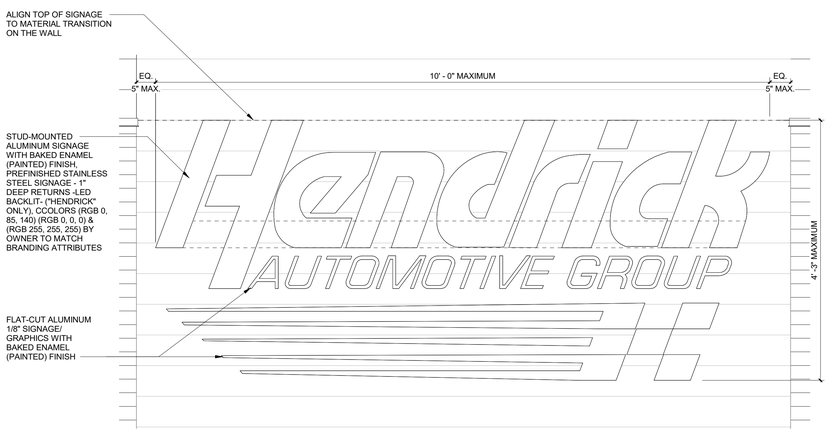
3-3-2025

SHEET NUMBER

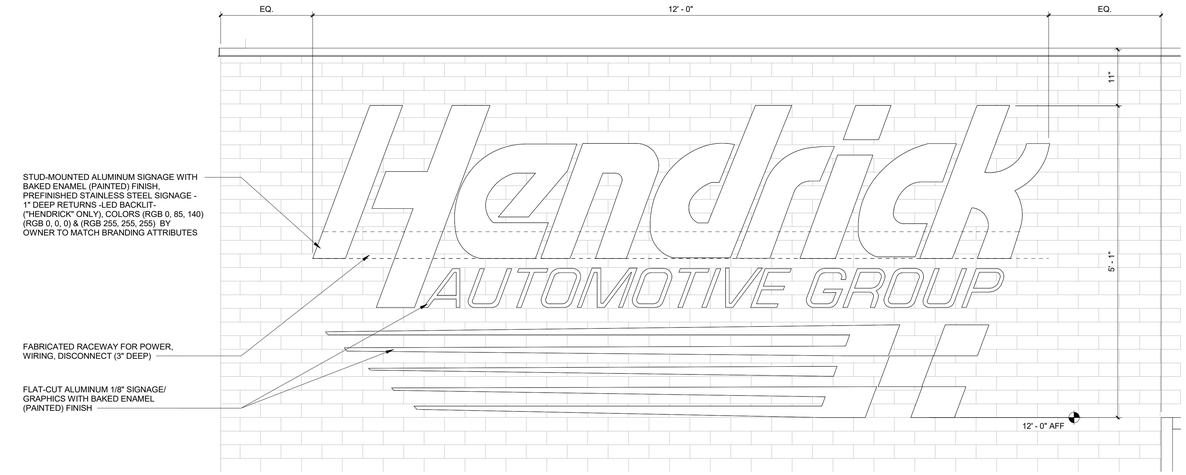
A900



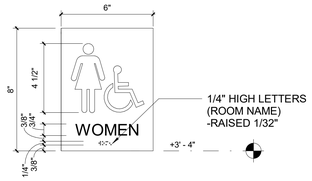
CANOPY SIGNAGE | 1" = 1'-0" | 4



NORTH ELEVATION LOGO SIGNAGE | 1" = 1'-0" | 3

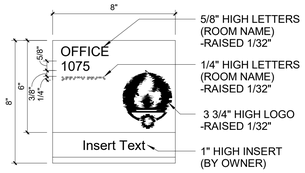


EAST ELEVATION LOGO SIGNAGE | 1" = 1'-0" | 2



-MATERIAL: 1/4" P95 ACRYLIC, SUBSURFACE PAINTED. SURFACE-APPLIED ADA RAISED GRAPHICS AND BRAILLE. FLAT DIRECT IMAGED SURFACE APPLIED SYMBOL.
-DEPTH: 1/4"
-FONT: ARIAL
-GRAPHIC + BACKGROUND COLOR: SELECTED FROM MANUFACTURER SELECTION.

SIGN TYPE #3 | 3" = 1'-0" | 7



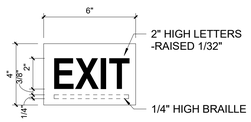
-BACKPLATE MATERIAL: 1/8" CLEAR ACRYLIC SECOND SURFACE PAINTED WITH THUMBHOLES (BACKGROUND COLOR: BLACK)

-GRAPHIC WINDOW: 1/4" P95 ACRYLIC HEAVY MATTE PAPER MASKED FACE WITH 1/16" SPACERS. SURFACE PAINT T+B BOTTOM TO HIDE SPACERS .

-BACKER 1/4" BACKER UNDERSIZED FROM EDGES

-GRAPHIC + BACKGROUND COLOR: SELECTED FROM MANUFACTURER SELECTION

SIGN TYPE #2 | 3" = 1'-0" | 6



MATERIAL: 1/4" P95 ACRYLIC

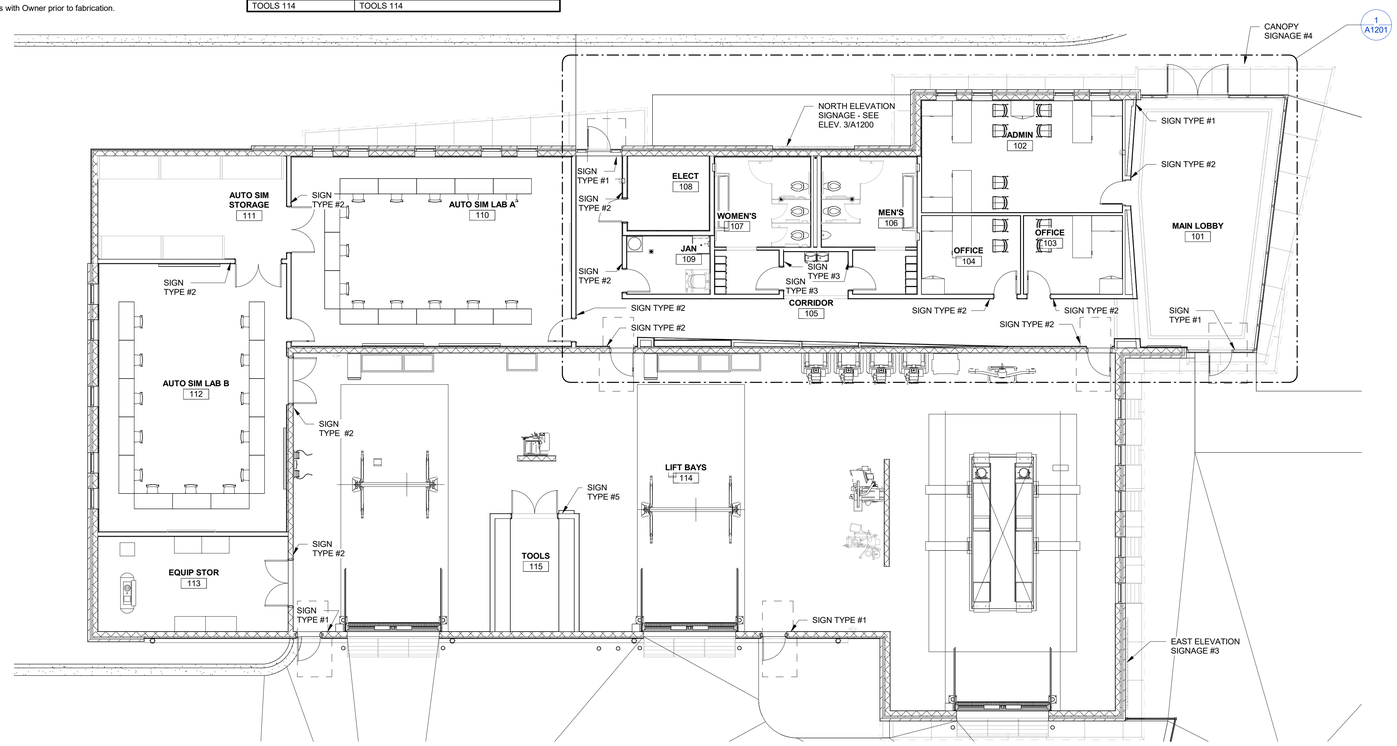
GRAPHIC + BACKGROUND COLOR: SELECTED FROM MANUFACTURER SELECTION

SIGN TYPE #1 | 3" = 1'-0" | 5

NOTES

1) See Signage Plans A1200 + A1201 for sign type.
2) Signs shall be mounted on the corridor wall at the strike side of the door. Locate the edge of the sign 2" from the edge of the door frame. Notify architect of any conflicts prior to installation.
3) All signs shall have non-glare finish. Characters + symbols shall contrast with the background (per NSCBE Vol. I-C 18.1.4).
4) All letters shall be upper case only with sharply defined edges. Sans serif or simple serif font shall be used (per NSCBE Vol. I-C 18.3.1).
5) No signs shall be mounted on glass. Coordinate with architect for alternate mounting locations if not specified.
6) All signs shall be mounted at +40" A.F.F. to centerline unless noted otherwise.
7) Confirm all proposed room names/numbers with Owner prior to fabrication.

ROOM DESIGNATION	SIGN COPY
LOBBY 101	LOBBY 101
ADMIN 102	ADMINISTRATION 102
OFFICE 103	OFFICE 103
OFFICE 104	OFFICE 104
MEN'S 106	MEN 105
WOMEN'S 107	WOMEN 106
JANITOR 109	JANITOR 107
ELECT 108	ELECTRICAL 108
AUTO SIM LAB A 110	AUTOMOTIVE SIMULATION LAB A 109
AUTO SIM STORAGE 111	AUTOMOTIVE SIMULATION STORAGE 110
AUTO SIM LAB B 112	AUTOMOTIVE SIMULATION LAB B 111
EQUIP STOR 113	EQUIPMENT STORAGE 112
LIFT BAYS 114	LIFT BAYS 113
TOOLS 114	TOOLS 114



SIGNAGE FLOOR PLAN | 1/8" = 1'-0" | 1

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RICHMOND COMMUNITY COLLEGE

SCO #22-25472-01A
NCCCS #2689

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HENDRICK CENTER FOR AUTOMOTIVE TRAINING

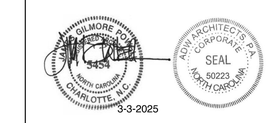
1042 West Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

SIGNAGE PLAN

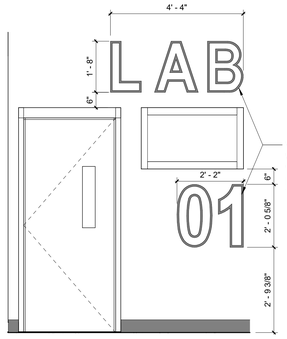
DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

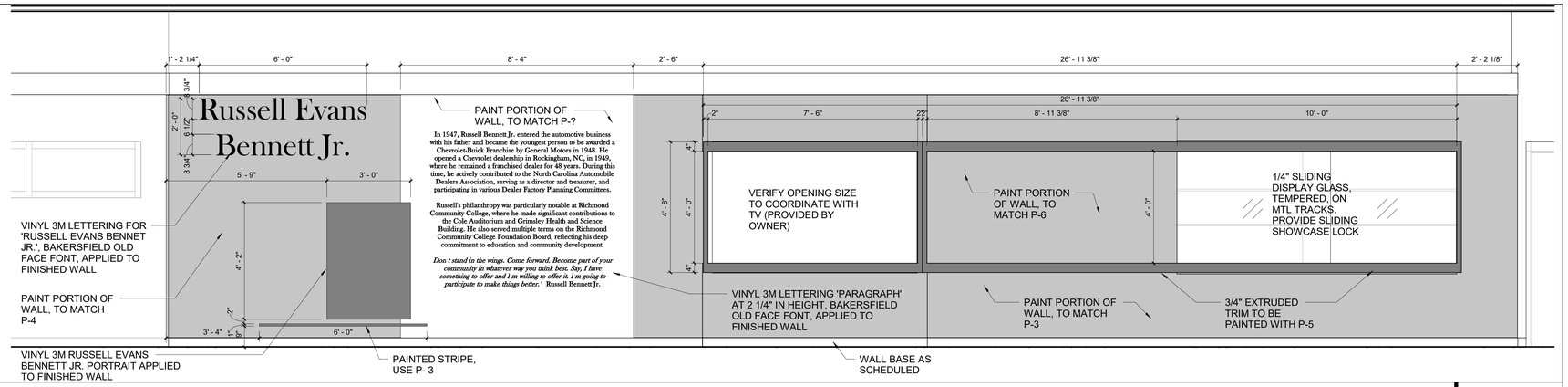


SHEET NUMBER

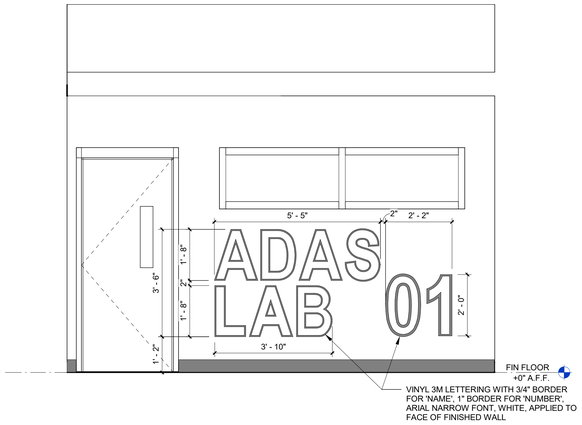
A1200



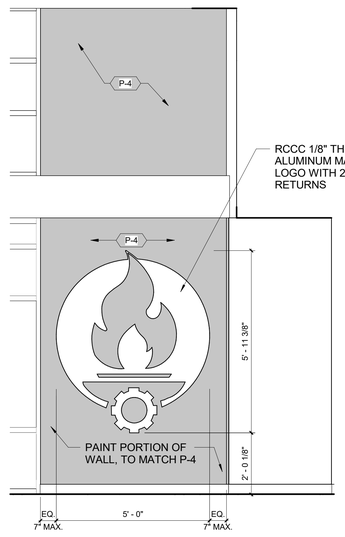
INTERIOR ELEVATION | 1/2" = 1'-0" | 6



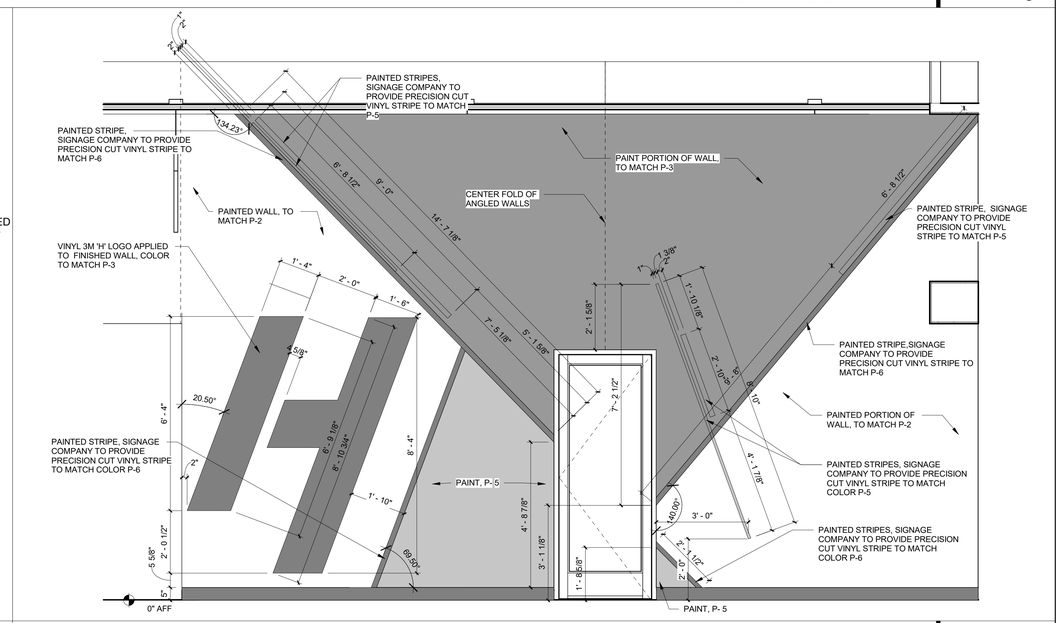
INTERIOR ELEVATION | 1/2" = 1'-0" | 3



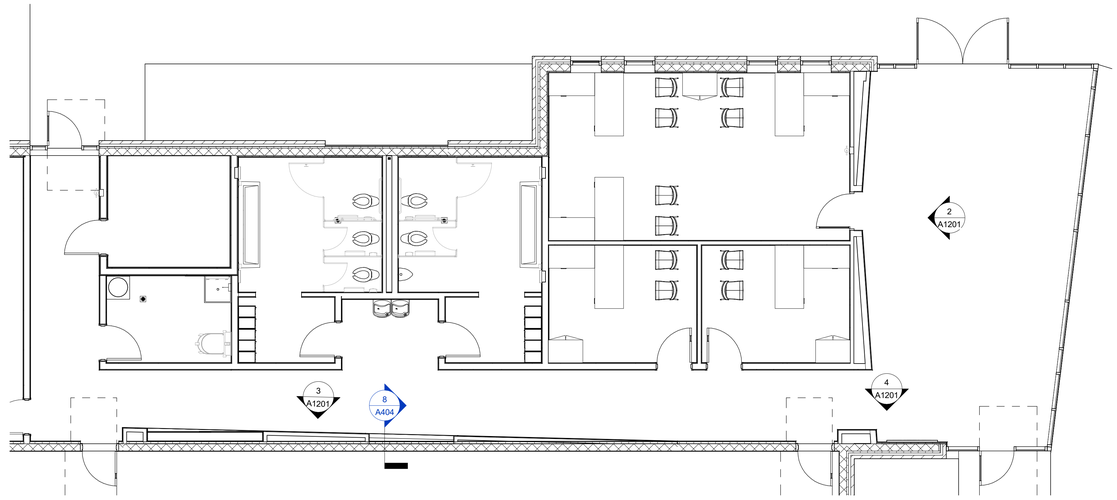
INTERIOR ELEVATION | 1/2" = 1'-0" | 5



INTERIOR ELEVATION | 1/2" = 1'-0" | 4



INTERIOR ELEVATION | 1/2" = 1'-0" | 2



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

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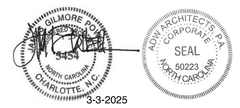
BID DOCUMENTS

SIGNAGE ENLARGED PLAN & WALL GRAPHICS

DATE: 3/3/2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:



3-3-2025

SHEET NUMBER

A1201

GENERAL

1. THESE GENERAL NOTES ARE NOT INTENDED TO REPLACE SPECIFICATIONS (IF PROVIDED). SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO THE GENERAL NOTES.
2. DO NOT SCALE DIMENSIONS FROM DRAWINGS. THE CONTRACTOR SHALL REQUEST NECESSARY DIMENSIONS NOT SHOWN ON THE DRAWINGS.
3. WHERE A DETAIL IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY REFERENCED ON THE DRAWINGS.
4. WHERE A CONFLICT BETWEEN DRAWINGS AND SPECIFICATIONS OCCURS THE MORE STRINGENT REQUIREMENT SHALL APPLY.
5. IF ANY BIDDER IS IN DOUBT AS TO THE INTENT OF THE DRAWINGS OR SPECIFICATIONS, THEY SHALL REQUEST AN INTERPRETATION IN WRITING PRIOR TO THE SCHEDULED BID DATE.
6. THE CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND GRADE CONDITIONS (BOTH NEW AND EXISTING), REPORTING ANY DISCREPANCIES TO THE ENGINEER OF RECORD PRIOR TO FABRICATION OR PROCEEDING WITH STRUCTURAL WORK.
7. THE CONTRACTOR SHALL COMPARE THE STRUCTURAL DRAWINGS WITH THE ARCHITECTURAL DRAWINGS, AND REPORT ANY DISCREPANCIES TO THE ENGINEER OF RECORD PRIOR TO FABRICATION OR PROCEEDING WITH STRUCTURAL WORK.
8. SEE ARCHITECTURAL DRAWINGS FOR FLOOR ELEVATIONS, FLOOR SLOPES, AND THE LOCATION OF DEPRESSED FLOOR AREAS.

CONTRACTOR RESPONSIBILITY

1. THE STRUCTURAL DRAWINGS AND SPECIFICATIONS (IF PROVIDED) REPRESENT THE FINISHED STRUCTURE, AND, EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, AND SEQUENCE. ALL APPLICABLE SAFETY REGULATIONS TO BE FOLLOWED STRICTLY.
2. THE STRUCTURE HAS BEEN DESIGNED TO RESIST DESIGN LOADS ONLY AS A COMPLETED STRUCTURE. APPLICATIONS OF CONSTRUCTION LOADS TO THE PARTIALLY COMPLETED STRUCTURE SHALL BE CONSIDERED BY THE CONTRACTOR AND SO INCLUDED IN THE DESIGN OF SHORING, BRACING, FORMWORK, AND ANY OTHER SUPPORTING ELEMENTS PROVIDED FOR CONSTRUCTION OF THE STRUCTURE. DURING ERECTION AND UNTIL ALL PERMANENT CONNECTIONS ARE MADE, THE CONTRACTOR MUST PROVIDE TEMPORARY BRACING FOR THE STRUCTURE IN ALL DIRECTIONS UNTIL THE STRUCTURAL WORK IS COMPLETE.
3. ALL INTERIOR HANGING COMPONENTS (CEILING, DUCTWORK, PIPING, EQUIPMENT, ETC.) SHALL BE COORDINATED BY THE CONTRACTOR TO ENSURE LOADS APPLIED TO THE STRUCTURE DO NOT EXCEED THE LIMITS SHOWN IN THE DESIGN CRITERIA OR ELSEWHERE IN THE DRAWINGS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY OF THE CONNECTIONS TO THE SUPPORTING STRUCTURAL ELEMENTS AND THE ADEQUACY OF THE HANGING SYSTEM TO SUPPORT THE COMPONENTS.
4. ALL ARCHITECTURAL, ELECTRICAL, MECHANICAL, AND PLUMBING COMPONENTS NOT SHOWN ON THE STRUCTURAL DRAWINGS, THAT FRAME TO THE UNDERSIDE OF STRUCTURE ABOVE, SHALL BE DETAILED AND FRAMED BY THE CONTRACTOR TO ALLOW FOR DEFLECTION OF THE STRUCTURAL FRAMING. SEE THE DESIGN CRITERIA FOR THE LIMITS USED IN THE DESIGN.
5. PRINCIPAL OPENINGS IN THE STRUCTURE ARE SHOWN ON THESE DRAWINGS. THE CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR ALL REQUIRED OPENINGS. SUPPORT FRAMING FOR ALL OPENINGS SHALL BE PROVIDED AND INSTALLED PER TYPICAL DETAILS HEREIN WHETHER SHOWN ON THESE DRAWINGS OR NOT. THE CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF ALL OPENINGS WITH ALL SUBCONTRACTORS AND THEIR APPROVED SHOP DRAWINGS PRIOR TO CONSTRUCTION.
6. ALL EXTERIOR WALL AND ROOF COMPONENTS AND CLADDING ENGINEERED BY THE COMPONENT MANUFACTURER ARE TO BE DESIGNED BY THE MANUFACTURER'S ENGINEER FOR COMPONENTS AND CLADDING WIND LOADS NOTED IN THE DESIGN CRITERIA.
7. ALL ARCHITECTURAL, ELECTRICAL, MECHANICAL, AND PLUMBING COMPONENTS ARE TO BE ATTACHED AS REQUIRED BY ASCE/SEI 7 CHAPTER 13, "SEISMIC DESIGN REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS". EACH INDIVIDUAL CONTRACTOR RESPONSIBLE FOR THE COMPONENT MUST PROVIDE PROJECT SPECIFIC DESIGN AND DOCUMENTATION PREPARED BY AN ENGINEER LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED. CHAPTER 13 DEFINES THE FORCE REQUIRED TO SUPPORT THE COMPONENT FOR THE ANCHORAGE AND BRACING. THE COST OF PREPARING THIS INFORMATION AND DESIGN SHALL BE INCLUDED IN EACH CONTRACTOR'S BID THAT IS PROVIDING THE COMPONENT.
8. SEVERAL ITEMS NOTED HEREIN (WHERE CHECKED) AND IN THE SPECIFICATIONS REQUIRE THE CONTRACTOR TO ENGAGE A PROFESSIONAL ENGINEER LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED, TO PROVIDE DESIGN AND/OR DETAILING OF STRUCTURAL ELEMENTS. SEE INDIVIDUAL NOTES AND SPECIFICATION SECTIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS. DELEGATED DESIGN ELEMENTS INCLUDE, BUT ARE NOT LIMITED TO:
   - ☐ SPECIALTY FOUNDATION SYSTEM
   - ☐ POST-TENSIONED CONCRETE (LAYOUT AND STRESSING)
   - ☐ STRUCTURAL PRECAST CONCRETE
   - ☐ ARCHITECTURAL PRECAST CONCRETE
   - ☒ STRUCTURAL STEEL (CONNECTIONS)
   - ☐ PREFABRICATED METAL BUILDING
   - ☐ STEEL STAIRS AND RAILINGS
   - ☒ STEEL JOISTS AND STEEL JOIST GIRDERS
   - ☐ ROOF ANCHORS
   - ☐ NON-LOAD BEARING COLD-FORMED STEEL
   - ☐ LOAD BEARING COLD-FORMED STEEL
   - ☐ LIGHT GAUGE COLD-FORMED STEEL TRUSSES
   - ☐ PREFABRICATED WOOD TRUSSES
   - ☐ ANCHOR TIE-DOWN SYSTEM FOR WOOD SHEAR WALLS

DESIGN CRITERIA

1. PROJECT LOCATION: 1042 WEST HAMLET AVE, HAMLET, NC 28345
2. APPLICABLE CODES:
   - 2018 NORTH CAROLINA BUILDING CODE (2015 INTERNATIONAL BUILDING CODE WITH REVISIONS)
   - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES (ASCE/SEI 7-10)
   - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-14)
   - BUILDING CODE REQUIREMENTS|SPECIFICATIONS FOR MASONRY STRUCTURES (ACI 530|530.1-13)
   - SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (AISC 360-10)
   - NORTH AMERICAN SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS (AISI S100-12)
3. RISK CATEGORY: II
4. DEFLECTION:

FLOOR FRAMING	L/240 FOR TOTAL LOADING (1.50" FOR 30' SPAN), L/360 FOR LIVE LOADING (1.00" FOR 30' SPAN)
ROOF FRAMING	L/180 FOR TOTAL LOADING (2.00" FOR 30' SPAN), L/240 FOR LIVE LOADING (1.50" FOR 30' SPAN)
MEMBERS SUPPORTING BRICK	L/600 FOR LIVE LOADING (0.60" FOR 30' SPAN)
STRUCTURAL DRIFT LIMITS	WIND, H/400 (USING V = 90 MPH AND MEAN RECURRENCE INTERVAL OF 50 YEARS) SEISMIC, PER ASCE 7 12.12

5. LIVE LOADS:

	UNIFORM (PSF)	CONCENTRATED (LB)
LIFT BAYS	150	2,000
CORRIDORS (GROUND)	100	2,000
MECHANICAL	150	NA
OFFICE	65*	2,000
PUBLIC AREAS, LOBBIES	100	2,000
ROOF	20	300
STORAGE	125	NA

* ADDITIONAL 15 PSF PARTITION LOAD INCLUDED

6. SNOW LOAD:

GROUND SNOW LOAD	p_g = 10 PSF
IMPORTANCE FACTOR	I_s = 1.00
SNOW EXPOSURE FACTOR	C_e = 1.00
THERMAL FACTOR	C_t = 1.00
FLAT SNOW ROOF LOAD	p_f = 7.0 PSF
MINIMUM SNOW LOAD	p_M = 10.0 PSF
RAIN ON SNOW SURCHARGE	5.0 PSF
DESIGN SNOW LOAD	12 PSF

7. WIND LOAD:

BASIC DESIGN WIND SPEED	V = 116 MPH (ALLOWABLE STRESS DESIGN WIND SPEED, V_{asd} = 90 MPH)	
EXPOSURE CATEGORY	B	
INTERNAL PRESSURE COEFFICIENTS	±0.18	
BASE SHEAR (1.0xW)	V_x = 27k	V_y = 56k

COMPONENTS AND CLADDING -

ALL EXTERIOR WALL AND ROOF COMPONENTS AND CLADDING ENGINEERED BY THE COMPONENT MANUFACTURER ARE TO BE DESIGNED BY THE MANUFACTURER'S ENGINEER FOR COMPONENTS AND CLADDING WIND LOADS AS DETERMINED PER THE GOVERNING BUILDING CODE FOR THE ULTIMATE DESIGN WIND SPEED AND EXPOSURE CATEGORY LISTED ABOVE. ALTERNATIVELY, THE COMPONENT MANUFACTURER MAY USE THE WORST-CASE PRESSURES (PSF) BELOW:

ZONE		EFFECTIVE WIND AREA (SF)			
		10	50	100	500
ROOF	1	+16 -39	+16 -32	+16 -30	+16 -24
ROOF	2	+16 -51	+16 -43	+16 -40	+16 -32
ROOF	3	+16 -69	+16 -54	+16 -47	+16 -32
WALL	4	+24 -26	+22 -24	+20 -22	+18 -20
WALL	5	+24 -32	+22 -27	+20 -25	+18 -20

8. SEISMIC LOAD:

DESIGN METHOD - EQUIVALENT LATERAL FORCE PROCEDURE

S_S	28.7 %g	
S_1	11.6 %g	
S_{DS}	30.1 %g	
S_{D1}	18.0 %g	
IMPORTANCE FACTOR	I_e = 1.00	
SITE CLASS	D (BASED ON GEOTECHNICAL REPORT)	
SEISMIC DESIGN CATEGORY	C	
SEISMIC FORCE-RESISTING SYSTEM - INTERMEDIATE MASONRY SHEAR WALLS (BEARING WALL SYSTEM)		
RESPONSE MODIFICATION COEFFICIENT	R_x = 3.5	R_y = 3.5
DEFLECTION AMPLIFICATION FACTOR	C_{dx} = 2.25	C_{dy} = 2.25
SEISMIC RESPONSE COEFFICIENT	C_{sx} = 0.086	C_{sy} = 0.086
BASE SHEAR (1.0xE)	V_x = 31k	V_y = 31k

9. FUTURE LOADS:

UNLESS SPECIFICALLY NOTED, THERE ARE NO PROVISIONS MADE FOR FUTURE FLOORS, ROOFS, OR OTHER LOADS.

FOUNDATIONS

1. FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL INVESTIGATION REPORT BY:
   ECS SOUTHEAST, LLP DATED OCTOBER 4, 2023 (PROJECT #33:6568)
   THE DESIGN NET ALLOWABLE SOIL BEARING PRESSURE IS 2,500 PSF BASED ON THIS REPORT.
2. ALL RECOMMENDATIONS AS OUTLINED IN THE GEOTECHNICAL INVESTIGATION REPORT AND AS NOTED ON THE DRAWINGS MUST BE FOLLOWED IN PREPARATION OF THE SUBGRADE, UNLESS OTHERWISE DIRECTED BY THE ENGINEER OF RECORD. THE CONTRACTOR SHALL OBTAIN THE REPORT FROM THE OWNER AND BE FAMILIAR WITH THE RECOMMENDATIONS CONTAINED THEREIN PRIOR TO THE START OF CONSTRUCTION. IF CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE DESCRIBED IN THE REPORT, THE OWNER SHALL NOTIFY THE GEOTECHNICAL ENGINEER OF RECORD SO THE RECOMMENDATIONS CAN BE REEVALUATED.
3. FOOTINGS SHALL BE CARRIED TO LOWER ELEVATIONS THAN THOSE SHOWN ON THE DRAWINGS IF REQUIRED BY THE GEOTECHNICAL ENGINEER OR TESTING LAB TO REACH SOIL CAPABLE OF PROVIDING THE DESIGN NET ALLOWABLE SOIL BEARING PRESSURE. ALL EXPANSIVE AND/OR LOOSE SOILS BELOW STRUCTURAL FOUNDATIONS SHALL BE REMOVED AND REPLACED AS DIRECTED HEREIN.
4. MINIMUM SUBGRADE PREPARATION REQUIREMENTS ARE AS FOLLOWS:
   1. PREPARE SUBGRADE AND UNDERFLOOR FILL TO A POINT THAT EXTENDS 10'-0" (MINIMUM) BEYOND THE LIMITS OF THE FOUNDATIONS.
   2. COMPACT ALL FILL UNDER BUILDING TO 95% MAXIMUM DRY DENSITY, 98% FOR UPPER 12", AS DETERMINED BY ASTM D698.
   3. PLACE IN LIFTS OF 8" (MAXIMUM) LOOSE THICKNESS WHEN USING LARGE RIDING COMPACTORS (REDUCE THICKNESS AS NECESSARY FOR SMALLER EQUIPMENT).
   4. SLABS ON GRADE SHALL BE SUPPORTED ON A BASE LAYER OF POROUS FILL (WASHED STONE OR CLEAN SAND) WITH A MINIMUM THICKNESS OF 4".
5. FIELD COMPACTION SHALL BE VERIFIED WITH AT LEAST ONE TEST PER 2,000 SQUARE FEET PER LIFT (AT LEAST ONE PER LIFT), IN ACCORDANCE WITH ASTM D1556 (SAND-CONE METHOD), ASTM D6938 (NUCLEAR METHODS, SHALLOW DEPTH), ASTM D2167 (RUBBER BALLOON METHOD), AND/OR ASTM D2937 (DRIVE-CYLINDER METHOD). SEE SPECIFICATIONS FOR OTHER TESTING REQUIREMENTS.
6. WALLS RETAINING SOIL SHALL BE TEMPORARILY BRACED DURING BACKFILLING AND UNTIL ALL SUPPORTING SOIL AND SLABS ARE IN PLACE AND ARE AT DESIGN STRENGTH UNLESS NOTED OTHERWISE ON PLANS AND DETAILS.
7. UTILITY LINES SHALL NOT BE PLACED THROUGH OR BELOW FOUNDATIONS WITHOUT APPROVAL OF THE STRUCTURAL ENGINEER. CONTRACTOR SHALL SUBMIT DETAILED DRAWINGS OF ALL SUCH CONDITIONS PRIOR TO CONSTRUCTION.

CONCRETE | REINFORCING STEEL

1. ALL CONCRETE DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REFERENCED EDITION OF THE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318).
2. CONCRETE MIXTURES AS REQUIRED (BASED ON CLASS DESIGNATION):

CLASS A - FOOTINGS	NWC	3,000 PSI
CLASS B - FOUNDATION WALLS, PEDESTALS	NWC	4,500 PSI
CLASS C - INTERIOR SLABS ON GRADE	NWC	3,000 PSI
CLASS F - EXTERIOR SLABS ON GRADE, PADS, TOPPINGS	NWC	4,500 PSI
CLASS J - EXTERIOR RETAINING WALLS	NWC	4,500 PSI

3. REINFORCING:
   TYPICAL - ASTM A615, GRADE 60
   REINFORCING TO BE WELDED - ASTM A706
   DEFORMED BAR ANCHORS - ASTM A496
   WELDED WIRE FABRIC - ASTM A1064 (FLAT SHEETS ONLY)
4. GROUT UNDER BASE PLATES TO BE HIGH STRENGTH (5,000 PSI), NON-SHRINK.
5. REFER TO THE DRAWINGS FOR REINFORCING LAP REQUIREMENTS. WHERE LAP SPLICES ARE NOT SHOWN, LAP PER ACI 318 OR CRSI STANDARDS.
6. LAP WELDED WIRE FABRIC SHEETS 12" MINIMUM.
7. CLEAR COVER FROM FACE OF CONCRETE:
   CAST IN PLACE CONCRETE (MEASURE TO OUTERMOST REINFORCING) -

CONCRETE CAST AGAINST AND EXPOSED TO EARTH	3"
CONCRETE EXPOSED TO EARTH/WEATHER	2" FOR #6 BARS AND LARGER, 1 1/2" ELSE
CONCRETE NOT EXPOSED TO EARTH/WEATHER	3/4" FOR SLABS AND WALLS, 1 1/2" (TO TIES) FOR BEAMS AND COLUMNS

8. PROVIDE REINFORCING IN SLABS ON GRADE, 1-1/2" FROM TOP OF SLAB:

4" SLABS	6x6-W2.1xW2.1
5" SLABS	6x6-W2.9xW2.9
6" SLABS	#3@12"OC EACH WAY
8" SLABS	#4@12"OC EACH WAY

9. WHERE SCHEDULED BARS ARE NOT PRESENT, PROVIDE CONTINUOUS #5 TOP AND BOTTOM BARS TO SUPPORT STIRRUPS AS REQUIRED FOR THE LENGTH OF THE STIRRUP SPACING IN ALL BEAMS.
10. WALL FOOTING REINFORCING SHALL BE CONTINUOUS THROUGH ADJACENT COLUMN FOOTINGS.
11. PROVIDE VERTICAL DOVETAIL SLOTS AT 24"OC WITH TIES AT 16"OC VERTICALLY IN ALL CONCRETE WALLS BACKING-UP MASONRY VENEER.
12. BAR SUPPORTS FOR CONCRETE EXPOSED TO VIEW SHALL HAVE PLASTIC COATED LEGS OR BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. MECHANICAL AND ELECTRICAL CONDUIT IN SLABS ON GRADE SHALL RUN UNDER TOP LAYER OF SLAB REINFORCING. PROVIDE A MINIMUM OF 1-1/2" CLEAR BETWEEN INDIVIDUAL CONDUITS AND REINFORCING. IF MAXIMUM SIZE OF CONDUIT EXCEEDS ONE THIRD OF THE SLAB DEPTH, ADDITIONAL FRAMING OR REINFORCING MAY BE NECESSARY AT ENGINEER'S DISCRETION.
14. MECHANICAL AND ELECTRICAL CONDUIT IN ELEVATED SLABS IS NOT ALLOWED UNLESS SPECIFICALLY REVIEWED AND APPROVED BY THE STRUCTURAL ENGINEER PRIOR TO PLACEMENT.
15. HEADED CONCRETE ANCHORS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A108, GRADES 1010, 1015, 1017, OR 1020. STUDS SHALL BE AUTOMATICALLY END WELDED IN THE SHOP OR FIELD IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
16. EMBED PLATES MUST BE SET IN THE FORM BEFORE POURING CONCRETE, NOT PLACED INTO TOP OF WET CONCRETE. THE CONTRACTOR SHALL CONTACT THE ARCHITECT FOR CORRECTIVE DETAILS FOR ANY EMBED PLATES LEFT OUT OF CONCRETE POURS.
17. FOR SLABS ON GRADE, SLAB AND FOOTING REINFORCING SHALL BE HELD IN PLACE BY BAR SUPPORTS WITH SAND PLATES, OR PRECAST CONCRETE BAR SUPPORTS AS DESCRIBED IN CHAPTER 3 OF THE CRSI MANUAL OF STANDARD PRACTICE. BAR SUPPORTS SHALL BE SPACED AT A MAXIMUM OF 4'-0"OC BOTH WAYS. ROCKS, CMU, OR CLAY BRICK WILL NOT BE USED AS SUPPORTS.
18. THE CONTRACTOR SHALL ASSUME CONCRETE OVERAGES IN ELEVATED DECK POURS DUE TO MEMBER AND DECK DEFLECTIONS. UNLESS SHOWN ON PLANS, BEAMS ARE NOT CAMBERED. CONCRETE OVERAGES MAY BE CALCULATED BY THE CONTRACTOR FOR BEAM DEFLECTIONS EQUALING L/300 INCLUDING ADDITIONAL DEFLECTIONS DUE TO PONDING AND DECK DEFLECTIONS PER SDI.
19. REBAR SHALL NOT BE HEATED WITH A TORCH IN THE FIELD.
20. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER FAR ENOUGH IN ADVANCE (48 HOURS) OF EACH CONCRETE POUR TO ALLOW AMPLE TIME TO CHECK THE LAYOUT OF THE STEEL BEFORE THE BEGINNING OF THE ACTUAL POUR, BUT NOT PRIOR TO 90% OF THE STEEL HAVING BEEN PLACED.

CONCRETE CONSTRUCTION JOINTS

1. CONTRACTOR SHALL PROVIDE NECESSARY CONSTRUCTION JOINTS IN MONOLITHIC CONCRETE POURS SO THAT THE QUALITY OF PLACEMENT AND FINISH MEETS THE REQUIREMENTS OF PLANS AND SPECIFICATIONS. THE CONTRACTOR SHALL SUBMIT A PLAN SHOWING THE LOCATION OF ALL CONSTRUCTION JOINTS TO THE STRUCTURAL ENGINEER FOR APPROVAL.
2. THERE SHALL BE NO HORIZONTAL CONSTRUCTION JOINTS IN CONCRETE POURS. ALL VERTICAL CONSTRUCTION JOINTS IN SLABS AND BEAMS SHALL BE MADE WITH BULKHEADS. ADDITIONAL REINFORCING AT CONSTRUCTION JOINTS SHALL BE AS SPECIFIED BY THE STRUCTURAL ENGINEER. SEE TYPICAL CONSTRUCTION JOINT DETAILS.

STRUCTURAL MASONRY

1. ALL MASONRY DESIGN AND CONSTRUCTION SHALL CONFORM TO THE REFERENCED EDITION OF THE BUILDING CODE REQUIREMENTS|SPECIFICATIONS FOR MASONRY STRUCTURES (ACI 530|530.1).
2. LOAD BEARING MASONRY WALLS, PILASTERS, PIERS, RETAINING WALLS, FOUNDATION WALLS AND ANY OTHER MASONRY SO DESIGNATED ON DRAWINGS IS CONSIDERED HERE TO BE STRUCTURAL MASONRY.
3. REQUIRED COMPRESSIVE STRENGTH OF MASONRY UNITS:
   SOLID CLAY UNITS - 6,200 PSI
   CONCRETE UNITS - 2,000 PSI ON NET AREA
4. CONCRETE MASONRY UNITS (CMU) SHALL BE LIGHT WEIGHT (105 PCF) CONFORMING TO ASTM C90. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR UNIT SIZE, FACE, COLOR, JOINTING, ETC.
5. MORTAR SHALL BE TYPE S, ASTM C270.
6. GROUT FOR REINFORCED MASONRY SHALL BE FINE GROUT, ASTM C476. MINIMUM 28-DAY COMPRESSIVE STRENGTH SHALL BE 2,000 PSI.
7. MINIMUM 28-DAY COMPRESSIVE STRENGTH (f'_m) OF THE MASONRY WALLS SHALL BE 2,000 PSI. MASONRY STRENGTH SHALL BE DETERMINED BY THE UNIT STRENGTH METHOD OR THE PRISM TEST METHOD AS DESCRIBED BY ACI 530.
8. REINFORCING:
   TYPICAL - ASTM A615, GRADE 60
   ALL REINFORCING TO BE WELDED - ASTM A706
9. REFER TO THE DRAWINGS FOR REINFORCING LAP TYPICAL DETAIL AND SCHEDULE REQUIREMENTS.
10. MAXIMUM HEIGHT TO WHICH MASONRY SHALL BE LAID BEFORE GROUTING IS 5 FEET ABOVE CONSTRUCTION SURFACE OR PREVIOUSLY GROUTED MASONRY. IF GROUT POUR HEIGHT EXCEEDS 5 FEET, THEN "HIGH LIFT" GROUTING PROCEDURE MUST BE FOLLOWED. PROVIDE CLEANOUT OPENINGS AT THE BOTTOM OF EACH GROUT POUR HEIGHT. CLEANOUT OPENINGS SHALL BE PROVIDED AT EACH CELL TO BE FILLED WITH GROUT.
11. ALL GROUT PLACED OVER 12" IN HEIGHT SHALL BE MECHANICALLY CONSOLIDATED DURING GROUTING. GROUT SHALL BE RECONSOLIDATED BY MECHANICAL VIBRATION AFTER INITIAL WATER LOSS AND SETTLEMENT HAS OCCURRED.
12. MAXIMUM GROUT LIFT (GROUT POURED IN ONE CONTINUOUS OPERATION) IS 5 FEET. THIS LIMIT ALSO APPLIES TO "HIGH LIFT" GROUTING.
13. REINFORCE MASONRY WHERE SHOWN ON STRUCTURAL DRAWINGS. TIE REINFORCING IN POSITION AND PLACE GROUT AROUND REINFORCING. DO NOT PUSH REINFORCING DOWN INTO PREVIOUSLY PLACED GROUT FILL. SET BOLTS SIMILARLY.
14. TIE MASONRY WYTHES WITH HORIZONTAL REINFORCING AS SPECIFIED.
15. PROVIDE VERTICAL BARS, SIZE MATCHING WALL REINFORCING, AT ALL CORNERS, ENDS OF WALLS, EACH SIDE OF CONTROL JOINTS AND EACH SIDE OF WALL OPENINGS. TIE EACH BAR TO THE FOUNDATION WITH A MATCHING DOWEL.
16. ALL CORNERS OF STRUCTURAL MASONRY WALLS SHALL BE CONSTRUCTED BY INTERLOCKING COURSES. AT INTERSECTIONS WHERE SEQUENCING OR BLOCK COURSING PROHIBITS INTERLOCKED CONSTRUCTION SEE ALTERNATE DETAILS HEREIN.
17. ALL LINTELS TO BEAR 8" MINIMUM EACH SIDE OF OPENING, UNLESS NOTED OTHERWISE.
18. GROUT ALL MASONRY WALLS AND CAVITY BELOW GRADE SOLID. GROUT ALL WALLS ABOVE GRADE AT THE REINFORCED CELLS (MINIMUM) OR AS INDICATED IN SPECIFIC SECTIONS.
19. ONE 3/4"Ø (MAXIMUM) VERTICAL CONDUIT ALLOWED IN ANY REINFORCED CELL PROVIDED 1" CLEAR IS MAINTAINED BETWEEN REINFORCING AND CONDUIT. NO OTHER VERTICAL OR HORIZONTAL CONDUITS, PIPES, OR SLEEVES SHALL BE LOCATED IN REINFORCED CELLS UNLESS OTHERWISE APPROVED BY THE STRUCTURAL ENGINEER. CONTRACTOR SHALL COORDINATE LAYOUT TO AVOID REINFORCED CELLS.

STRUCTURAL STEEL

1. DESIGN, FABRICATION, AND ERECTION SHALL BE PER THE SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (ANSI/AISC 360).
2. STRUCTURAL STEEL MATERIALS:
   WIDE FLANGE SHAPES (W SECTIONS) - ASTM A992, GRADE 50 (FY=50 KSI)
   CHANNELS AND ANGLES - ASTM A36 (FY=36 KSI)
   PLATES AND BARS - ASTM A36 (FY=36 KSI) OR ASTM A572, GRADE 50 (FY=50 KSI) AS INDICATED ON THE DRAWINGS.
   SQUARE AND RECTANGULAR TUBES - ASTM A500, GRADE B (FY=46 KSI)
   PIPES OR ROUND TUBES - ASTM A53, GRADE B (FY=35 KSI) OR ASTM A500, GRADE B (FY=42 KSI)
3. A QUALIFIED FABRICATOR SHALL HAVE A MINIMUM OF 5 YEARS OF EXPERIENCE IN FABRICATING STRUCTURAL STEEL LIKE THAT INDICATED FOR THIS PROJECT AND SUFFICIENT CAPACITY TO FABRICATE THE STRUCTURAL STEEL WITHOUT DELAYING THE WORK, AND SHALL MEET ONE OF THE FOLLOWING:
   A. FABRICATOR PARTICIPATES IN THE AISC QUALITY CERTIFICATION PROGRAM AND IS DESIGNATED AN AISC-CERTIFIED PLANT, CATEGORY (BU) OR IS ACCREDITED BY THE IAS FABRICATOR INSPECTION PROGRAM FOR STRUCTURAL STEEL (ACCREDITATION CRITERIA 172).
   B. FABRICATOR HAS AN ESTABLISHED AND MAINTAINED QUALITY CONTROL PROGRAM TO ENSURE THAT THE WORK IS PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS IN ANSI/AISC 303, ANSI/AISC 360, AND THE CONTRACT DOCUMENTS. PROGRAM SHALL AT A MINIMUM ADDRESS INSPECTION OF THE ITEMS NOTED IN ANSI/AISC 360 N2.
4. A QUALIFIED ERECTOR SHALL HAVE A MINIMUM OF 5 YEARS OF EXPERIENCE IN ERECTING STRUCTURAL STEEL LIKE THAT INDICATED FOR THIS PROJECT AND SUFFICIENT CAPACITY TO ERECT THE STRUCTURAL STEEL WITHOUT DELAYING THE WORK, AND SHALL MEET ONE OF THE FOLLOWING:
   A. ERECTOR PARTICIPATES IN THE AISC QUALITY CERTIFICATION PROGRAM AND IS DESIGNATED AN AISC-CERTIFIED ERECTOR, CATEGORY (CSE).
   B. ERECTOR HAS AN ESTABLISHED AND MAINTAINED QUALITY CONTROL PROGRAM TO ENSURE THAT THE WORK IS PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS IN ANSI/AISC 303, ANSI/AISC 360, AND THE CONTRACT DOCUMENTS. PROGRAM SHALL AT A MINIMUM ADDRESS INSPECTION OF THE ITEMS NOTED IN ANSI/AISC 360 N2.
5. BEAM SIMPLE SHEAR, BRACED FRAME, AND ALL MOMENT CONNECTIONS NOT DETAILED ON STRUCTURAL DRAWINGS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER RETAINED BY THE STEEL SUPPLIER AND REGISTERED IN THE STATE IN WHICH THE PROJECT IS LOCATED. THE CONNECTION ENGINEER SHALL SUBMIT A SIGNED AND SEALED LETTER STATING THEY HAVE REVIEWED THE STEEL SHOP DRAWINGS AND THE CONNECTIONS ARE CONSISTENT WITH THEIR CALCULATIONS AND INTENT.
6. THE CONNECTIONS FOR NON-COMPOSITE BEAMS SHALL BE DESIGNED FOR REACTIONS SHOWN ON DRAWINGS OR FOR REACTIONS DETERMINED BY USING THE MAXIMUM TOTAL UNIFORM LOAD TABULATED IN PART 3 OF THE AISC STEEL CONSTRUCTION MANUAL FOR THE SECTION, SPAN, AND STRENGTH OF STEEL SPECIFIED. THE CONNECTIONS FOR COMPOSITE BEAMS SHALL BE DESIGNED FOR REACTIONS SHOWN ON DRAWINGS OR AS DICTATED BY THE TYPICAL COMPOSITE SLAB DETAIL.
7. SIMPLE SHEAR CONNECTIONS SHALL BE MADE WITH ASTM A325 3/4"Ø BOLTS (MINIMUM), TIGHTENED TO A SNUG-TIGHT CONDITION PER AISC REQUIREMENTS.
8. ALL WELDING SHALL CONFORM TO THE AMERICAN WELDING SOCIETY CODE. USE E70 SERIES ELECTRODES FOR ALL STRUCTURAL STEEL WELDS. WHERE STEEL MEMBERS ARE WELDED AND NO SIZE IS SPECIFIED, PROVIDE FULL LENGTH FILLET WELDS BOTH SIDES OF MEMBER. SIZE OF FILLETS SHALL BE 3/16" FOR MEMBER THICKNESS UP TO 5/16", AND THE MEMBER THICKNESS MINUS 3/16" FOR ALL THICKER MATERIALS.
9. ANCHOR AND THREADED RODS SHALL CONFORM TO ASTM F1554, GRADE 36, 55, OR 105 AS INDICATED ON THE DRAWINGS. CONTRACTOR TO COORDINATE INSTALLATION OF ITEMS TO BE EMBEDDED IN OR ATTACHED TO OTHER CONSTRUCTION WITHOUT DELAYING THE WORK.
10. STEEL SHALL BE PRIMED WITH FABRICATOR'S STANDARD LEAD- AND CHROMATE-FREE, NON-ASPHALTIC, RUST-INHIBITING PRIMER COMPLYING WITH MPI#79 (MINIMUM COAT OF 3 MILS, MAXIMUM OF 5 MILS). CONTRACTOR TO COORDINATE SELECTION OF PRIMER WITH TOPCOATS TO BE APPLIED TO ENSURE THE TWO ARE COMPATIBLE. MEMBERS TO RECEIVE FIREPROOFING OR TO BE ENCASED IN CONCRETE SHALL NOT BE PRIMED.
11. SEE THE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR ALL ITEMS REQUIRED TO BE HOT-DIP GALVANIZED AFTER FABRICATION.
12. STRUCTURAL STEEL SHALL BE PUNCHED FOR WOOD BLOCKING, NAILERS, CLIPS AND TIES IN ACCORDANCE WITH THE ARCHITECTURAL AND STRUCTURAL DRAWINGS.
13. CAP ALL OPEN HSS OR PIPE MEMBERS OUTSIDE THE BUILDING ENVELOPE WITH A 1/4" (MINIMUM) FITTED PLATE, UNO.
14. ERECTOR SHALL SET STRUCTURAL STEEL IN LOCATIONS AND TO ELEVATIONS IN ACCORDANCE WITH ANSI/AISC 303 AND 360. MAINTAIN THE FRAME WITHIN ERECTION TOLERANCES PER ANSI/AISC 303.
15. PROMPTLY PACK SHRINKAGE-RESISTANT GROUT SOLIDLY BETWEEN BEARING SURFACES AND PLATES SO NO VOIDS REMAIN.
16. SPLICING OF STRUCTURAL STEEL MEMBERS IS PROHIBITED WITHOUT PRIOR APPROVAL OF THE ENGINEER AS TO LOCATION AND TYPE OF SPLICE TO BE MADE. ANY MEMBER HAVING A SPLICE NOT SHOWN AND DETAILED ON SHOP DRAWINGS WILL BE REJECTED. THERMAL CUTTING MAY NOT BE USED IN THE FIELD DURING ERECTION.
17. QUALITY CONTROL INSPECTION TASKS SHALL BE PERFORMED BY BOTH THE FABRICATOR AND ERECTOR IN ACCORDANCE WITH ANSI/AISC 360 N5. NON-DESTRUCTIVE TESTING (NDT) OF WELDED JOINTS PROVIDED DURING FABRICATION SHALL BE IN ACCORDANCE WITH N5.5 AND PERFORMED BY AN INDEPENDENT AND QUALIFIED TESTING AGENCY OR THE FABRICATOR'S QCI. ALL TESTING REPORTS SHALL BE SUBMITTED TO THE OWNER FOR REVIEW.
18. AT THE COMPLETION OF FABRICATION AND ERECTION, THE FABRICATOR AND ERECTOR SHALL EACH SUBMIT A CERTIFICATE OF COMPLIANCE TO THE OWNER STATING THE MATERIALS SUPPLIED AND WORK PERFORMED ARE IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
19. NON-DESTRUCTIVE TESTING (NDT) OF WELDED JOINTS PROVIDED DURING ERECTION SHALL BE IN ACCORDANCE WITH N5.5 AND PERFORMED BY AN INDEPENDENT AND QUALIFIED TESTING AGENCY. ALL TESTING REPORTS SHALL BE SUBMITTED TO THE OWNER FOR REVIEW.

STEEL JOISTS

1. ALL STEEL JOISTS SHALL BE OPEN-WEB TYPE CONFORMING TO THE LATEST EDITION OF "STANDARD SPECIFICATIONS, LOAD TABLES AND WEIGHT TABLES FOR STEEL JOISTS AND JOIST GIRDERS" PUBLISHED BY THE STEEL JOIST INSTITUTE.
2. PROVIDE BRIDGING PER STEEL JOIST INSTITUTE STANDARD SPECIFICATION. ALL BRIDGING SHALL BE BOLTED OR WELDED AT ALL JOISTS AND AT ALL CROSSINGS AND ANCHORED TO SPANDREL MEMBERS. ALL BRIDGING FOR JOISTS USED AS SPANDREL MEMBERS (AT EDGE OF DECK) SHALL BE "X" BRIDGING. SIZE OF BRIDGING SHALL BE DETERMINED BY THE JOIST SUPPLIER. JOIST SUPPLIER TO PROVIDE ADDITIONAL BRIDGING AS REQUIRED FOR UPLIFT LOADS.
3. ALL JOISTS SHALL HAVE ANGLE BOTTOM CHORD MEMBERS UNLESS OTHERWISE APPROVED.
4. ALL K-SERIES JOISTS SHALL BE WELDED TO SUPPORT STEEL WITH A MINIMUM OF 2" OF 1/8" FILLET WELD AT BOTH SIDES OF JOIST SEAT.
5. WHERE JOISTS FRAME TO COLUMNS, JOISTS SHALL BE FIELD BOLTED TO COLUMNS WITH (2)1/2"Ø A307 BOLTS AT EACH END OF THE JOIST TO PROVIDE LATERAL STABILITY DURING CONSTRUCTION.
6. PROVIDE BOLTED DIAGONAL BRIDGING WHERE REQUIRED PER STEEL JOIST INSTITUTE STANDARD SPECIFICATIONS. JOIST SHOP DRAWINGS SHALL INDICATE ALL JOISTS WHICH SHALL HAVE A ROW OF BOLTED BRIDGING IN PLACE BEFORE SLACKENING OF HOISTING LINES.
7. JOIST MANUFACTURER SHALL BE PREPARED TO SUBMIT CALCULATIONS FOR ALL JOISTS AT ARCHITECT'S OR ENGINEER'S REQUEST. CALCULATIONS SHALL HAVE LOAD DIAGRAMS FOR EACH MEMBER CLEARLY INDICATING SPAN, UNIFORM AND CONCENTRATED LOADS. ALL CALCULATIONS SHALL BEAR THE SEAL OF A REGISTERED PROFESSIONAL ENGINEER LICENSED IN THE STATE IN WHICH THE PROJECT IS LOCATED.
8. JOISTS SHALL BE DESIGNED FOR A NET WIND UPLIFT LOAD OF 32 PSF (ULTIMATE) UNLESS NOTED OTHERWISE.

ADHESIVE AND MECHANICAL POST-INSTALLED ANCHORS

1. ANCHOR BOLTS, REINFORCING STEEL, THREADED RODS, STAIR HANDRAILS, AND OTHER EMBEDDED STEEL ITEMS SHALL BE SET INTO HARDENED CONCRETE WITH ADHESIVE OR MECHANICAL POST-INSTALLED ANCHORS ONLY WHERE DETAILED ON THE DRAWINGS OR WHERE APPROVED BY THE ENGINEER OF RECORD.
2. PRE-APPROVED MANUFACTURERS ARE HILTI, SIMPSON STRONG-TIE, AND DEWALT. WHERE DETAILS INDICATE SPECIFIC ADHESIVE OR MECHANICAL POST-INSTALLED ANCHORS, IT IS ACCEPTABLE AT THE CONTRACTOR'S OPTION TO SUBMIT AN ALTERNATE SIMILAR PRODUCT PROVIDED BY A DIFFERENT MANUFACTURER AS LONG AS THE MANUFACTURER'S DATA PROVIDES EQUIVALENT LOAD CAPACITY TO THE ANCHOR SPECIFIED. THE CONTRACTOR SHALL PROVIDE SIGNED AND SEALED CALCULATIONS THAT DEMONSTRATE THE ALTERNATE PRODUCT IS CAPABLE OF MEETING THE PERFORMANCE OF THE SPECIFIED ANCHOR. SUBSTITUTIONS WILL BE EVALUATED BY THEIR HAVING AN ICC-ESR SHOWING COMPLIANCE WITH THE GOVERNING BUILDING CODE FOR SEISMIC USE, LOAD RESISTANCE, INSTALLATION CATEGORY, AND THE AVAILABILITY OF COMPREHENSIVE INSTALLATION INSTRUCTIONS. ADHESIVE ANCHOR EVALUATION WILL ALSO CONSIDER CREEP, IN-SERVICE TEMPERATURE, INSTALLATION TEMPERATURE, MOISTURE CONDITION OF CONCRETE, AND DRILLING METHODS.
3. BASIS OF DESIGN FOR ADHESIVE ANCHORS DETAILED ON THE DRAWINGS INCLUDES THE FOLLOWING PARAMETERS: CRACKED CONCRETE; WATER-SATURATED CONCRETE; BASE MATERIAL BETWEEN 25 AND 100 DEGREES FAHRENHEIT; AND HOLES MADE BY HAMMER DRILL, HOLLOW DRILL BIT SYSTEM, OR CORE-DRILLING.
4. INSTALL ANCHORS PER THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, AS INCLUDED IN THE ANCHOR PACKAGING. HEED ALL LABEL WARNINGS. INSTALL IN ACCORDANCE WITH APPLICABLE SAFETY LAWS. ALL HOLES SHALL BE DRILLED WITH A DIAMETER NO LARGER THAN 1/8" GREATER THAN THE DIAMETER OF THE ANCHOR BEING INSTALLED. ALL HOLES SHALL BE CLEANED WITH COMPRESSED AIR AND SHALL BE DRY PRIOR TO INSTALLATION OF ADHESIVE. HOLES SHALL BE FREE OF ALL DELETERIOUS MATERIAL SUCH AS LAITANCE, DUST, DIRT, AND OIL.
5. ANCHOR CAPACITY IS DEPENDENT UPON SPACING BETWEEN ADJACENT ANCHORS AND PROXIMITY OF ANCHORS TO EDGE OF CONCRETE. INSTALL ANCHORS IN ACCORDANCE WITH SPACING AND EDGE CLEARANCES INDICATED ON THE DRAWINGS.
6. WHERE ADHESIVE ANCHORS ARE TO BE INSTALLED IN HOLLOW MATERIAL WITH UNKNOWN CAPACITY, THE CONTRACTOR SHALL INSTALL THE ANCHOR IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. THE ADHESIVE SHALL BE INSTALLED IN THE HOLLOW BASE MATERIAL USING SCREEN TUBES SUPPLIED BY THE MANUFACTURER. THE ADHESIVE SHALL BE CAPABLE OF SUSTAINING MINIMUM TENSION AND SHEAR LOAD CAPACITIES NOTED ON THE DRAWINGS MULTIPLIED BY A FACTOR OF SAFETY OF 4. ALL HARDWARE AND MATERIAL SHALL BE SUPPLIED BY THE ANCHOR MANUFACTURER.
7. CONTRACTOR PERFORMING ADHESIVE WORK SHALL BE AN APPROVED CONTRACTOR BY THE MANUFACTURER FURNISHING THE ADHESIVE MATERIALS, AND SHALL HAVE NO LESS THAN FIVE YEARS EXPERIENCE IN THE VARIOUS TYPES OF ADHESIVE RELATED WORK REQUIRED IN THIS PROJECT. ALTERNATIVELY, THE CONTRACTOR SHALL ARRANGE FOR A REPRESENTATIVE OF THE ANCHOR MANUFACTURER TO PROVIDE ONSITE INSTALLATION TRAINING FOR ALL ANCHOR PRODUCTS SPECIFIED. DOCUMENTATION THAT ALL PERSONNEL INSTALLING ANCHORS ARE TRAINED SHALL BE SUBMITTED TO THE ENGINEER OF RECORD PRIOR TO THE COMMENCEMENT OF ANCHOR INSTALLATION.
8. THE ULTIMATE TENSION AND SHEAR CAPACITIES SHALL BE DETERMINED BY A JOB SITE TEST PERFORMED ON A MINIMUM OF FIVE INSTALLED SAMPLES WHICH ARE REPRESENTATIVE OF THE ACTUAL INSTALLATIONS. TESTING SHALL BE PERFORMED BY THE ADHESIVE ANCHOR MANUFACTURER OR HIS APPROVED REPRESENTATIVE AND SHALL BE DOCUMENTED FOR THE DESIGN PROFESSIONAL.

REPRODUCTION

1. THE USE OF REPRODUCTIONS OF THESE CONTRACT DRAWINGS BY ANY CONTRACTOR, SUBCONTRACTOR, ERECTOR, FABRICATOR, OR MATERIAL SUPPLIER IN LIEU OF PREPARATION OF SHOP DRAWINGS SIGNIFIES HIS ACCEPTANCE OF ALL INFORMATION SHOWN HEREIN AS CORRECT, AND OBLIGATES HIMSELF TO ANY JOB EXPENSE, REAL OR IMPLIED, ARISING DUE TO ANY ERRORS THAT MAY OCCUR HERE ON.

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BID DOCUMENTS

GENERAL NOTES

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

NORTH CAROLINA PROFESSIONAL SEAL 036929 ENGINEER KIRSTEN A. BALDWIN METZGER
03/03/2025

SHEET NUMBER
S001

ABBREVIATIONS

@	AT
&	AND
Ø	DIAMETER
AB	ANCHOR BOLTS
ACI	AMERICAN CONCRETE INSTITUTE
ADDL	ADDITIONAL
ADH	ADHESIVE
AFF	ABOVE FINISHED FLOOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
ALT	ALTERNATE
ARCH	ARCHITECT'S / ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
B/ or BOT	BOTTOM
BCX	BOTTOM CHORD EXTENSION
BFB	BOTTOM FLANGE BRACE
BFF	BELOW FINISHED FLOOR
BLDG	BUILDING
BM	BEAM
BOS	BOTTOM OF STEEL
BRG	BEARING
BTWN	BETWEEN
CANT	CANTILEVER
CJ	CONTROL JOINT
CL	CENTERLINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONST JT	CONSTRUCTION JOINT
CONT	CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CTRD	CENTERED
d	NAILS (PENNY)
DBA	DEFORMED BAR ANCHOR
DEFL	DEFLECTION
DEPR	DEPRESSION / DEPRESSED
DET	DETAIL
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTANCE
DWG(S)	DRAWING(S)
DWL(S)	DOWEL(S)
EA	EACH
EE	EACH END
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEV	ELEVATOR
EMBED	EMBEDDED / EMBEDMENT
ENGR	ENGINEER
EOD	EDGE OF DECK
EOS	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FDN	FOUNDATION
FFE	FINISHED FLOOR ELEVATION
FOM	FACE OF MASONRY
FOW	FACE OF WALL
FS	FAR SIDE
FTG	FOOTING
GA	GAUGE
GALV	GALVANIZED
GT	GIRDER TRUSS
HD	HEADED
HI	HIGH
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
INT	INTERIOR
JT	JOINT
K	KIP(S)
KB	KNEE BRACE
KSI	KIPS PER SQUARE INCH
LB	LONG BAR
LBS	POUNDS
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LO	LOW
LOC	LOCATION
LSH	LONG SIDE HORIZONTAL
LSV	LONG SIDE VERTICAL
LWC	LIGHT WEIGHT CONCRETE
MAX	MAXIMUM
MC	MOMENT CONNECTION
MCJ	MASONRY CONTROL JOINT
MECH	MECHANICAL
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MOW	MIDDLE OF WALL
MP	MASONRY PILASTER
No or #	NUMBER
NS	NEAR SIDE
NTS	NOT TO SCALE
NWC	NORMAL WEIGHT CONCRETE
OC	ON CENTER
OPNG	OPENING
OPP	OPPOSITE HAND
PAF	POWDER ACTUATED FASTENER
PED	PEDESTAL
PL	PLATE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
P-T	POST-TENSIONED
REF	REFERENCE
REINF	REINFORCING
REQD	REQUIRED
SB	SHORT BAR
SCHD	SCHEDULE
SIM	SIMILAR
SOG	SLAB ON GRADE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
STD	STANDARD
STIFF	STIFFENER
STIRR	STIRRUP(S)
STL	STEEL
STR	STRUCTURAL
T/	TOP
TCX	TOP CHORD EXTENSION
TOC	TOP CHORD CONCRETE
TOF	TOP OF FOOTING
TOS	TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W/	WITH
WWF	WELDED WIRE FABRIC
WP	WORK POINT

SYMBOL LEGEND

SYMBOL	MEANING
	SPOT ELEVATION. ELEVATION RELATIVE TO REFERENCE ELEVATION.
<No>	TOP OF FOOTING, GRADE BEAM, PILE CAP, OR DRILLED PIER. ELEVATION RELATIVE TO REFERENCE ELEVATION.
<No> <No>	STEP IN TOP OF FOOTING ELEVATION, SEE "TYPICAL STEP IN WALL FOOTING" DETAIL. ELEVATION RELATIVE TO REFERENCE ELEVATION.
No	DEPRESSED OR RAISED SLAB ELEVATION, SEE "TYPICAL STEP IN SLAB ON GRADE" DETAIL. ELEVATION RELATIVE TO REFERENCE ELEVATION.
{No}	TOP OF WALL OR PEDESTAL. ELEVATION RELATIVE TO REFERENCE ELEVATION.
(No) | [+No]	TOP OF STEEL/JOIST BEARING ELEVATION | TOP OF STEEL ABOVE STEEL/JOIST BEARING ELEVATION.
	SLOPED | STEPPED SLAB.
F#	SPREAD FOOTING TYPE, SEE SCHEDULE.
P#	CONCRETE PEDESTAL TYPE, SEE SCHEDULE.
MP#	MASONRY PILASTER TYPE, SEE "TYPICAL MASONRY PILASTERS" DETAIL.
ML#	MASONRY LINTEL TYPE, SEE "TYPICAL LOAD BEARING LINTELS" DETAIL.
BP#	STEEL BEARING PLATE TYPE, SEE "TYPICAL STEEL BEAM BEARING" DETAIL.
MSW#	MASONRY SHEAR WALL TYPE, SEE SCHEDULE.
D1	SPAN DIRECTION OF METAL ROOF DECK, SEE "TYPICAL 1 1/2" METAL ROOF DECK" DETAIL. CONSTRUCTION SHALL BE 1 1/2"-18GA METAL ROOF DECK.
V#, M#, L#, A#, T#	STEEL BEAM DESIGN END REACTIONS (WHERE APPLICABLE). "V" INDICATES VERTICAL SHEAR, "M" INDICATES BENDING MOMENT, "H" INDICATES LATERAL SHEAR, "A" INDICATES AXIAL TENSION/COMPRESSION, AND "T" INDICATES TORSION. ALL LOADS ARE FACTORED FOR STRENGTH DESIGN IN UNITS OF KIP AND KIP-FT. ALL LOADS SHALL BE CONSIDERED REVERSIBLE, UNO.
	STEEL BEAM MOMENT CONNECTION.
VF#	VERTICAL FRAME TYPE, SEE ELEVATIONS.
SSW#	METAL STUD SHEAR WALL TYPE, SEE SCHEDULE.

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ABBREVIATIONS AND SYMBOL LEGEND

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS

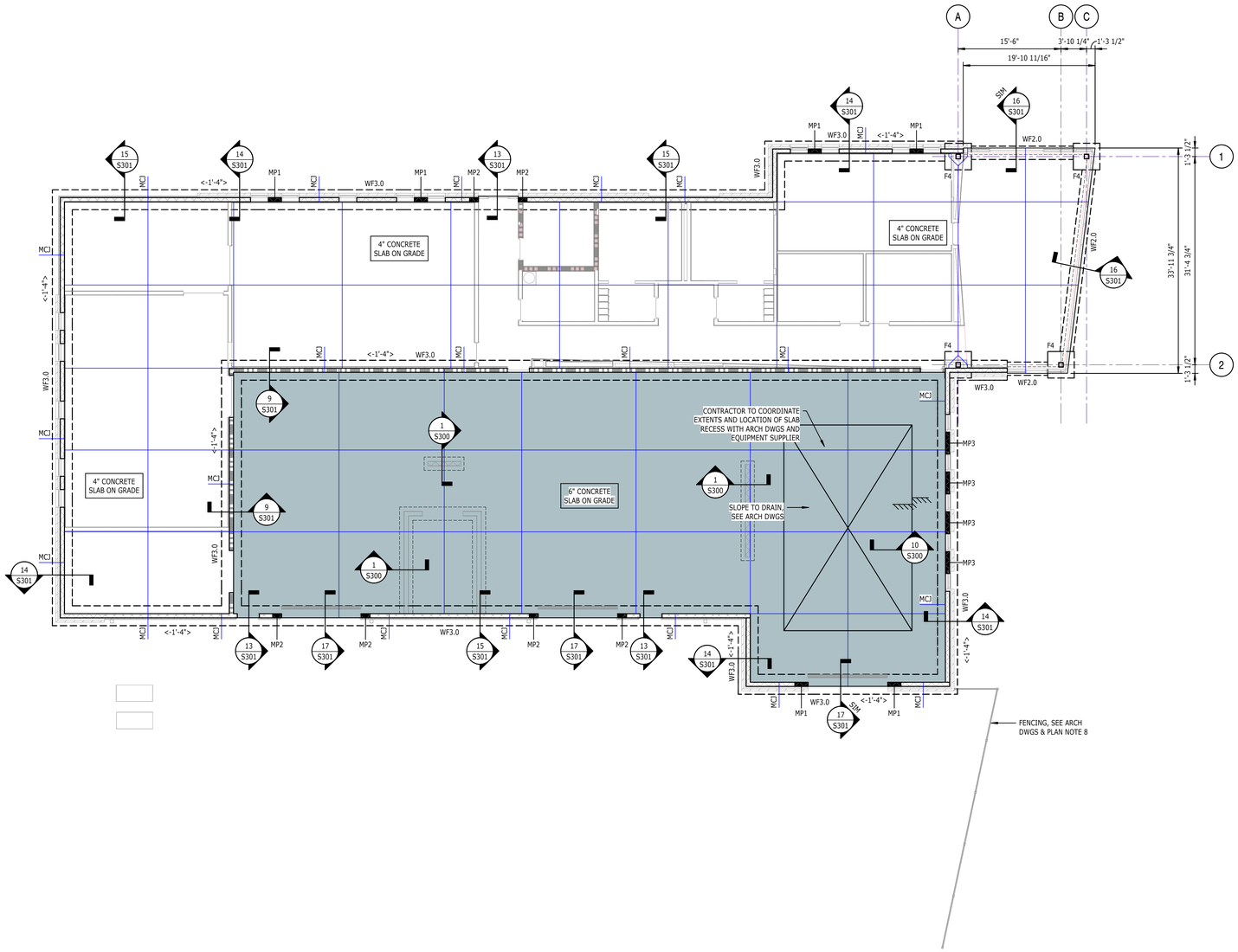
NO: DATE: DESCRIPTION:

NORTH CAROLINA PROFESSIONAL SEAL 036929 ENGINEER JEFFREY A. BALDWIN

03/03/2025

SHEET NUMBER

S002



FOUNDATION PLAN

1/8" = 1'-0"

FOUNDATION PLAN NOTES:

1. SEE S001 AND S002 FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. REFERENCE FINISHED FLOOR ELEVATION 0'-0". ACTUAL ELEVATION IS 295.67', CONFIRM WITH CIVIL DWGS.
3. SEE S300 FOR TYPICAL SLAB CONSTRUCTION DETAILS.
4. SEE S500 FOR STEEL COLUMN SCHEDULE.
5. TOP OF FOOTING ELEVATION 1'-4" BELOW FINISHED FLOOR ELEVATION, UNO.
6. CONTRACTOR TO COORDINATE ALL THICKENED SLAB LOCATIONS UNDER CMU PARTITIONS WITH ARCHITECTURAL DRAWINGS.
7. SLOPE EXTERIOR SLABS, SIDEWALKS, AND PAVING AS INDICATED ON THE ARCHITECTURAL DRAWINGS.
8. FOOTINGS FOR FENCING TO BE COORDINATED WITH BLDG FOOTINGS, UTILITIES, ETC. PROVIDE 12" DIA x 3'-0" DEEP FOOTINGS AT ALL POST LOCATIONS. FINAL SPACING TO BE COORDINATED WITH FINAL SHOP DRAWINGS. SEE FOUNDATION DETAILS FOR CMU SCREENWALL ALTERNATE.
9. SEE S402 FOR CMU WALL REINFORCING SCHEDULE.

LOAD BEARING WALL LEGEND:
- INDICATES NON-LOAD BEARING WALL.
- INDICATES LOAD BEARING MASONRY SHEAR WALL.

WALL FOOTING SCHEDULE

MARK	SIZE		REINFORCEMENT	
	WIDTH	DEPTH	CONTINUOUS	TRANSVERSE
WF2.0	2'-0"	1'-0"	(3)#4	#4@18"OC
WF3.0	3'-0"	1'-3"	(4)#5 TOP & BOT	#6@12"OC TOP & BOT

SPREAD FOOTING SCHEDULE

MARK	SIZE			REINFORCEMENT (EACH WAY)	
	WIDTH	LENGTH	DEPTH	TOP	BOTTOM
F4	4'-0"	4'-0"	1'-0"	NA	(5)#5

NOTE: HOOK REINF 90° EACH END

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FOUNDATION PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS

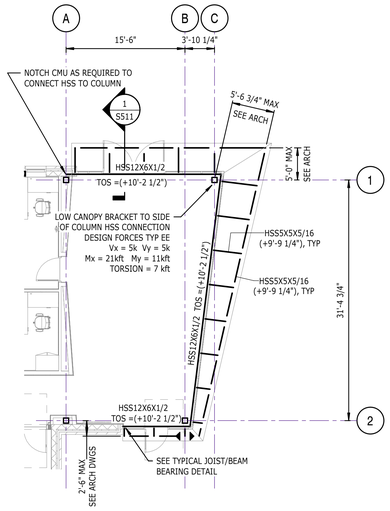
NO:	DATE:	DESCRIPTION:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036929 CHRISTIAN A. BALDWIN METZER

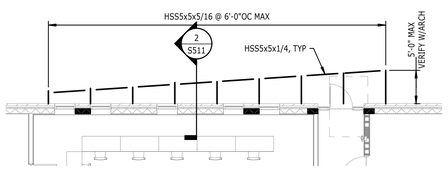
03/03/2025

SHEET NUMBER

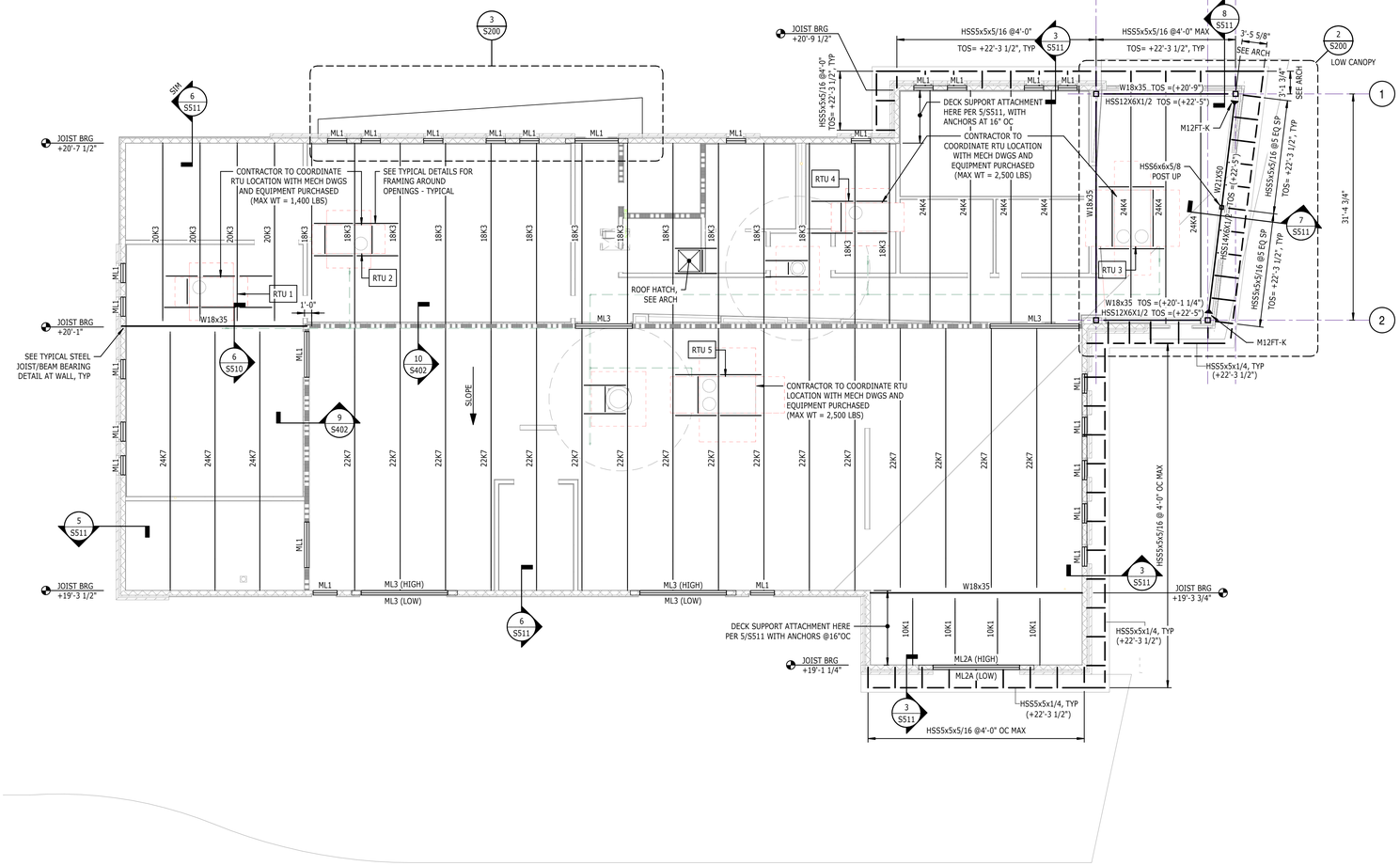
S100



2 S200 LOW CANOPY FRAMING PLAN
1/8" = 1'-0"



3 S200 LOW CANOPY FRAMING PLAN
1/8" = 1'-0"



1 S200 ROOF FRAMING PLAN
1/8" = 1'-0"

ROOF FRAMING PLAN NOTES:
1. SEE S001 AND S002 FOR GENERAL NOTES, ABBREVIATIONS, AND SYMBOL LEGEND.
2. SEE S510 FOR TYPICAL STEEL ROOF FRAMING DETAILS.
3. SEE S500 FOR STEEL COLUMN SCHEDULE.
4. SEE S402 FOR CMU WALL REINFORCING SCHEDULE.
5. SEE ARCHITECTURAL DRAWINGS FOR ALL ROOF SLOPES.
6. STEEL MEMBERS ARE EQUALLY SPACED ALONG SUPPORTING MEMBERS(6'-0" MAX), UNO.

LOAD BEARING WALL LEGEND:
- INDICATES NON-LOAD BEARING WALL.
- INDICATES LOAD BEARING MASONRY SHEAR WALL.

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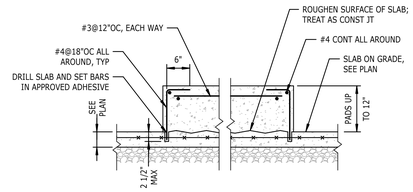
ROOF FRAMING PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

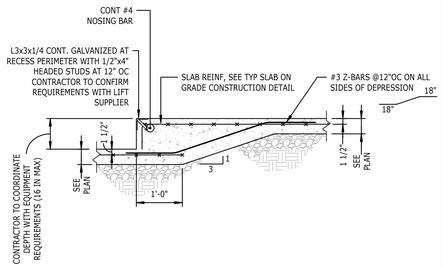
NORTH CAROLINA PROFESSIONAL SEAL 036929 ENGINEER WESLEY A. BALDWIN METTER
03/03/2025

SHEET NUMBER
S200

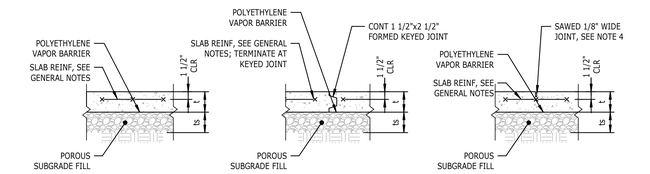


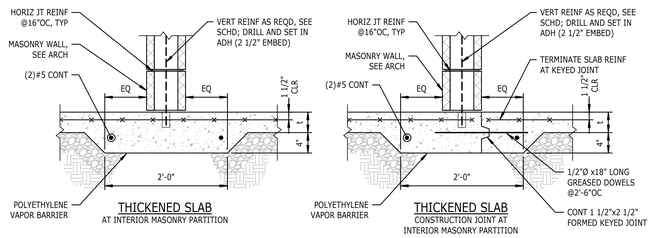
NOTES:
1. THE EXACT SIZE, SHAPE, AND LOCATION OF EQUIPMENT (HOUSEKEEPING) PAD(S) SHALL BE DETERMINED BY THE CONTRACTOR AFTER APPROVAL OF EQUIPMENT SHOP DRAWINGS. ANCHOR BOLTS WHERE REQUIRED SHALL BE SIZED AND LOCATED ACCORDING TO MANUFACTURER'S REQUIREMENTS.

9 / S300 TYPICAL EQUIPMENT PAD
3/4" = 1'-0"



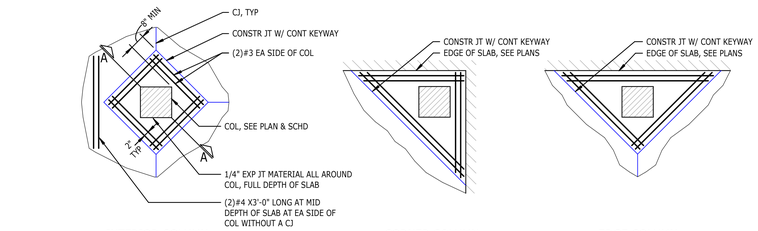
10 / S300 TYPICAL STEP IN SLAB ON GRADE
3/4" = 1'-0"

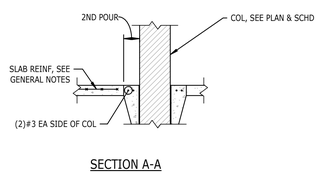




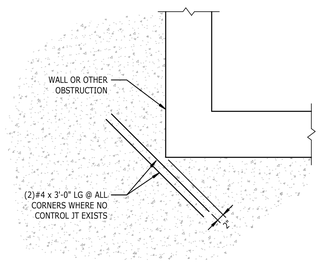
NOTES:
1. 't' DENOTES SLAB THICKNESS, SEE PLANS. 'ts' DENOTES POROUS SUBGRADE FILL THICKNESS, SEE "FOUNDATION" GENERAL NOTES.
2. LOCATION OF SLAB ON GRADE CONSTRUCTION JOINTS SHALL BE DETERMINED BY THE CONTRACTOR. JOINT LOCATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
3. SEE PLANS FOR LOCATION OF CONTROL JOINTS. WHERE NOT SHOWN ON PLAN, CONTACT THE ENGINEER.
4. CUT JOINTS SHALL BE 1/4t (1/3t FOR FIBER-REINFORCED SLABS) OR 1" DEEP WHICHEVER IS GREATER. SAW CUT CONTROL JOINTS WITHIN 8 HOURS OF SLAB POUR.
5. 15ML-THICK POLYETHYLENE VAPOR BARRIOR TO BE PLACED UNDER ALL SLABS, TURNDOWNS, TRENCHES, TRENCH DRAINS, GRADE BEAMS, ETC.

1 / S300 TYPICAL SLAB ON GRADE
1" = 1'-0"

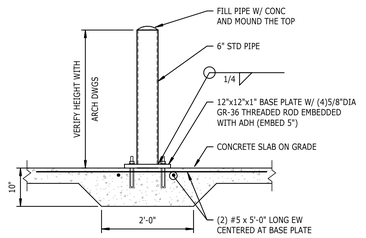




7 / S300 TYPICAL COLUMN ISOLATION JOINTS
1/2" = 1'-0"

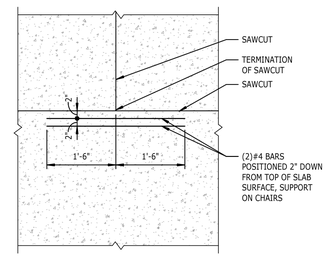


3 / S300 TYPICAL SLAB AT CORNERS
3/4" = 1'-0"



NOTE:
1. SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS. SEE CIVIL DWGS FOR EXTERIOR BOLLARD DETAILS.

8 / S300 TYPICAL INTERIOR BOLLARD
3/4" = 1'-0"



4 / S300 TYPICAL AT CONTROL JOINT TERMINATION
3/4" = 1'-0"

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SLAB ON GRADE DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

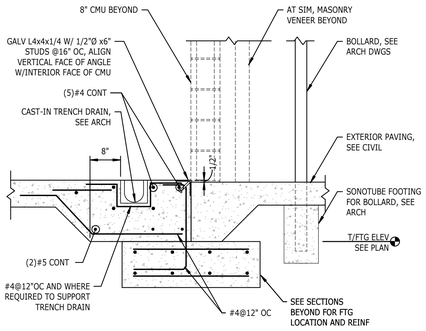
REVISIONS
NO: DATE: DESCRIPTION:

NORTH CAROLINA PROFESSIONAL SEAL 036929 ENGINEER KRISTEN A. BALDWIN METZER

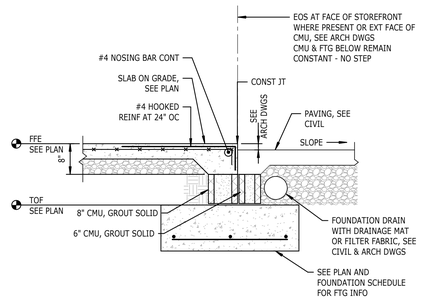
03/03/2025

SHEET NUMBER

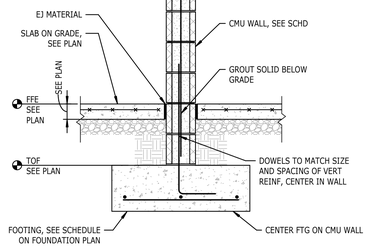
S300



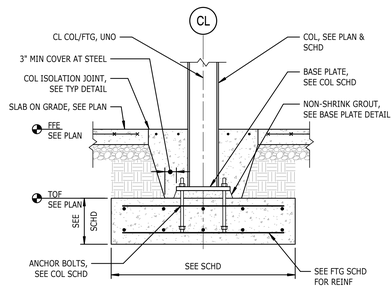
17 S301 SECTION
3/4" = 1'-0"



13 S301 TYPICAL SLAB ON GRADE AT DOOR
3/4" = 1'-0"



9 S301 TYPICAL INTERIOR CMU LOAD BEARING WALL
3/4" = 1'-0"

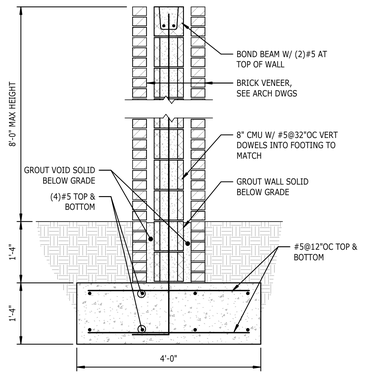


5 S301 TYPICAL FOOTING AT STEEL COLUMN
3/4" = 1'-0"

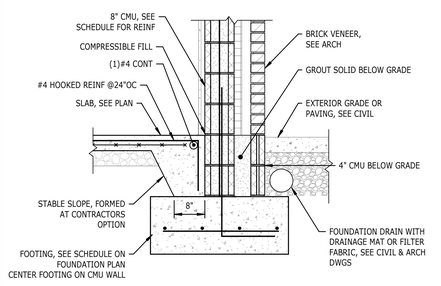
CONCRETE REINFORCING SPLICES			
BAR SIZE	f'c = 3,000 PSI	f'c = 4,000 PSI	f'c = 5,000 PSI
#3	1'-10"	1'-7"	1'-5"
#4	2'-4"	2'-1"	1'-10"
#5	3'-0"	2'-7"	2'-4"
#6	3'-7"	3'-1"	2'-9"
#7	5'-2"	4'-6"	4'-1"
#8	5'-11"	5'-2"	4'-8"
#9	6'-6"	5'-10"	5'-3"
#10	7'-6"	6'-6"	5'-10"
#11	8'-4"	7'-3"	6'-6"

NOTES:
1. FOR CLASS B LAP SPLICE, SPLICE LENGTH = 1.3 x DEVELOPMENT LENGTH.
2. APPLIES TO BOTTOM BARS ONLY (LESS THAN 12" OF FRESH CONCRETE BELOW BAR).
3. APPLIES WHERE THE CLEAR COVER IS GREATER THAN THE BAR DIAMETER.
4. WHEN MORE THAN 12" OF FRESH CONCRETE BELOW SPLICE, THEN INCREASE SPLICE TO 1.3 x SPLICE LENGTH.

1 S301 CONCRETE REINFORCING SPLICE SCHEDULE
3/4" = 1'-0"

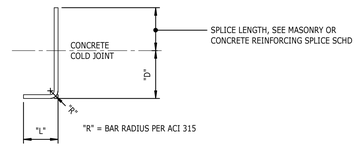


18 S301 CMU SCREENWALL (ALTERNATE)
3/4" = 1'-0"



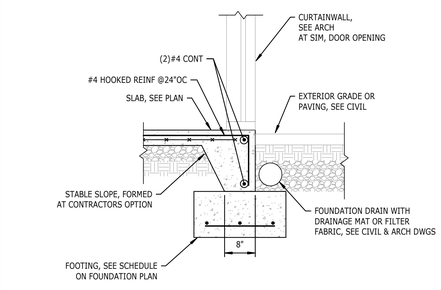
14 S301 SECTION
3/4" = 1'-0"

CONCRETE REINFORCING DOWEL EMBEDMENT				
BAR SIZE	LEG DIM, "L"	EMBEDMENT, "D"		
		f'c = 3,000 PSI	f'c = 4,000 PSI	f'c = 5,000 PSI
#3	6"	6"	6"	6"
#4	8"	8"	7"	6"
#5	10"	10"	9"	8"
#6	12"	12"	10"	9"
#7	14"	14"	12"	11"
#8	16"	16"	14"	12"
#9	19"	18"	15"	14"
#10	22"	20"	17"	15"
#11	24"	22"	19"	17"

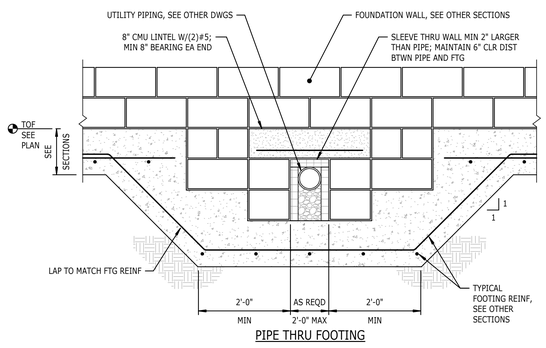


NOTES:
1. FOR CONCRETE STRENGTHS NOT PROVIDED, USE THE EMBEDMENT LENGTH FOR THE LOWER CONCRETE STRENGTH AS SHOWN IN THE TABLE.
2. DOWEL LENGTHS BASED ON NORMAL WEIGHT CONCRETE. FOR LIGHT WEIGHT, INCREASE DOWEL LENGTH "D" BY 30%.
3. SIDE COVER ON BARS MUST BE GREATER THAN 2 1/2". END COVER ON 90° HOOKED BARS MUST BE GREATER THAN 2".
4. FOR EPOXY-COATED BARS, INCREASE THE DOWEL LENGTH "D" BY 20%.

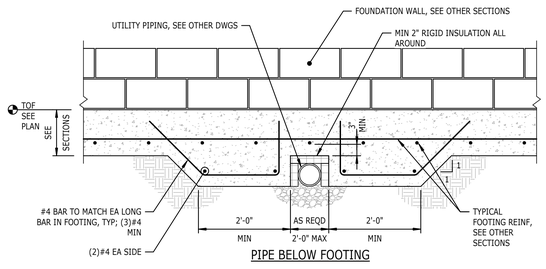
2 S301 DOWEL EMBEDMENT LENGTH SCHEDULE
3/4" = 1'-0"



15 S301 SECTION
3/4" = 1'-0"

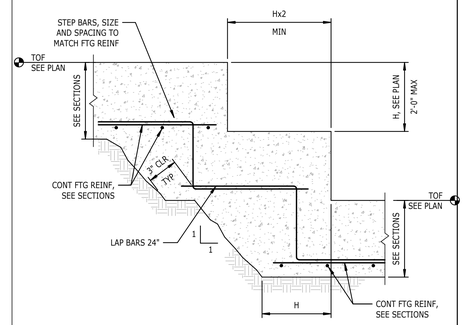


PIPE THRU FOOTING



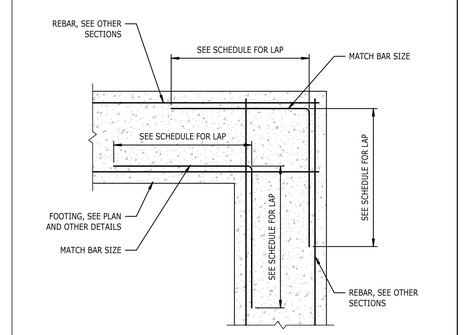
PIPE BELOW FOOTING

7 S301 TYPICAL UTILITY BELOW FOOTING
3/4" = 1'-0"



3 S301 TYPICAL STEP IN WALL FOOTING
3/4" = 1'-0"

16 S301 SECTION
3/4" = 1'-0"



4 S301 TYPICAL FOOTING CORNER
3/4" = 1'-0"

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HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

FOUNDATION DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

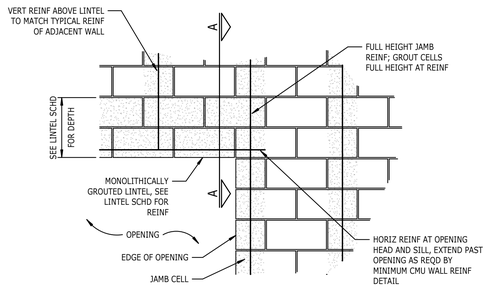
REVISIONS
NO: DATE: DESCRIPTION:

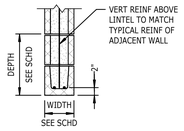
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036929 KRISTEN A. BALDWIN METZER

03/03/2025

SHEET NUMBER

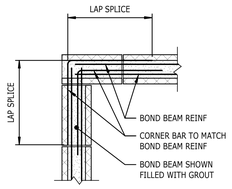
S301





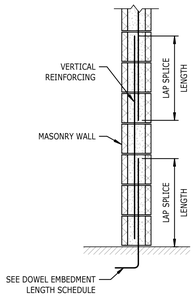
SECTION A-A

13 S400 TYPICAL LINTEL|JAMB CONSTRUCTION
3/4" = 1'-0"

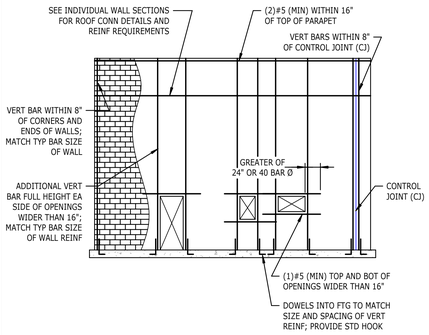


9 S400 TYPICAL BOND BEAM CORNER
3/4" = 1'-0"

MINIMUM SPLICE AND EMBEDMENT LENGTH SCHEDULE	
BAR SIZE	LAP SPLICE
#3	27"
#4	36"
#5	45"
#6	54"
#7	63"
#8	72"

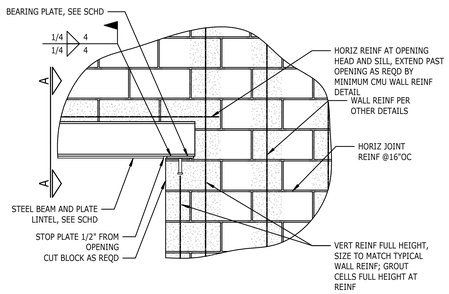


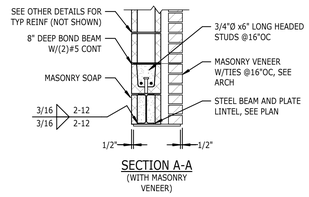
5 S400 MASONRY REINFORCING SPLICE SCHEDULE
3/4" = 1'-0"



NOTES:
1. REINFORCING SHOWN IS A MINIMUM REQUIREMENT, INDIVIDUAL WALL SECTION REINFORCING REQUIREMENTS (SUCH AS NUMBER OR SIZE OF BARS) SHALL TAKE PRECEDENCE OVER THE REQUIREMENTS SHOWN HEREIN. SEE INDIVIDUAL WALL SECTIONS AND SCHEDULES FOR VERTICAL REINFORCING REQUIREMENTS.
2. ALL DISCONTINUOUS REINFORCEMENT SHALL BE LAPPED PER MINIMUM SPLICE AND EMBEDMENT LENGTH SCHEDULE.
3. VERTICAL STEEL MUST BE SECURED IN PLACE BEFORE THE BLOCKS ARE LAID. ALL VERTICAL REINFORCEMENT SHALL BE CONTINUOUS THROUGH MASONRY LINTELS AND BOND BEAMS, UNO.
4. AT OPENINGS WHERE STEEL BEAM LINTELS ARE PROVIDED, REINFORCE THE JAMB CELL TO THE BEARING ELEVATION OF THE LINTEL, AND REINFORCE THE NEXT ADJACENT CELL PAST THE END OF THE BEAM FULL HEIGHT AS SHOWN IN THIS DETAIL.
5. DETAIL DOES NOT APPLY TO INTERIOR NON-LOAD BEARING PARTITION WALLS.
6. PROVIDE MINIMUM (2) LEGS OF W1.7 HORIZONTAL JOINT REINFORCING @ 16"OC VERTICALLY.

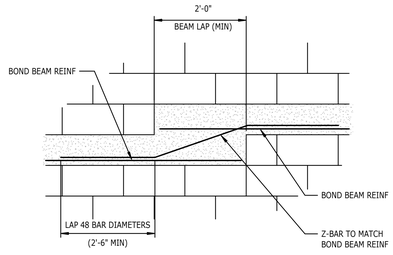
1 S400 MINIMUM WALL REINFORCING
3/4" = 1'-0"



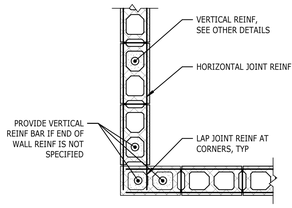


SECTION A-A
(WITH MASONRY VENEER)

14 S400 TYPICAL STEEL LINTEL|JAMB CONSTRUCTION
3/4" = 1'-0"

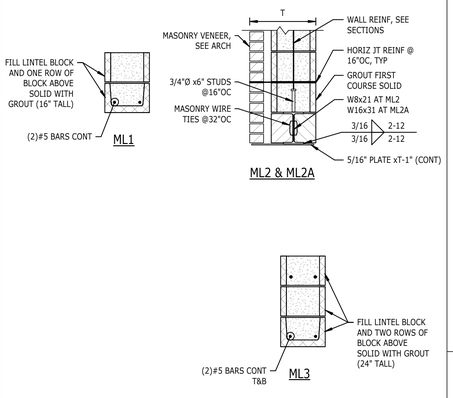


10 S400 TYPICAL STEP IN BOND BEAM
3/4" = 1'-0"



NOTES:
1. PROVIDE DOWELS TO FOUNDATION MATCHING SIZE OF VERTICAL REINFORCING, TYPICAL. SEE GENERAL NOTES OR MINIMUM SPLICE AND EMBEDMENT LENGTH SCHEDULE FOR LAP REQUIREMENTS.

6 S400 TYPICAL WALL CORNER
3/4" = 1'-0"



ML1

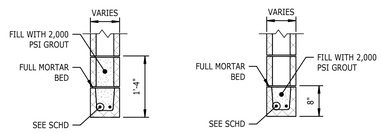
ML2 & ML2A

ML3

NON-LOAD BEARING CMU LINTEL SCHEDULE							
LINTEL SIZE / OPENING SIZE	4"x8"	6"x8"	6"x16"	8"x8"	8"x16"	12"x8"	12"x16"
3'-4"	(1)#3	(1)#3	NA	(1)#3	NA	(2)#4	NA
4'-0"	(1)#3	(1)#4	NA	(2)#3	NA	(2)#4	NA
4'-8"	(1)#4	(1)#4	NA	(2)#4	NA	(2)#4	NA
5'-4"	(1)#4	(2)#4	NA	(2)#4	NA	(2)#5	NA
6'-0"	(1)#5	(2)#4	(1)#4	(2)#4	(2)#4	(2)#5	(2)#4
6'-8"	NA	NA	(1)#5	NA	(2)#4	NA	(2)#4
7'-4"	NA	NA	(1)#5	NA	(2)#4	NA	(2)#5
8'-0"	NA	NA	(1)#6	NA	(2)#4	NA	(2)#5
8'-8"	NA	NA	(1)#6	NA	(2)#5	NA	(2)#6
9'-4"	NA	NA	(1)#7	NA	(2)#5	NA	(2)#6

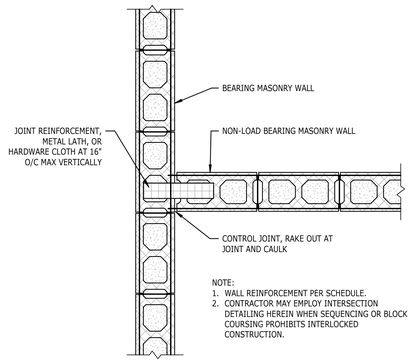
NOTES:
1. FOR LINTELS IN CMU WALLS, MATCH CORRESPONDING WALL WIDTH.
2. 1" MINIMUM CLEAR SPACE SHALL BE PROVIDED AROUND ALL REINFORCING.
3. WALL ABOVE LINTEL SHALL BE REINFORCED VERTICALLY SIMILAR TO WALL ON EITHER SIDE OF LINTEL.
4. HORIZONTAL REINFORCING SHALL EXTEND BEYOND EDGE OF OPENING PER LINTEL/JAMB REINFORCING DETAILS.
5. LINTELS OVER OPENINGS NOT SHOWN ON PLAN SHALL BE AS FOLLOWS (INTERIOR OR EXTERIOR WALLS):
   A. FOR OPENINGS UP TO 5'-0", PROVIDE TYPE ML1 LINTEL. FOR OPENINGS UP TO 5'-0" IN CMU + BRICK WALLS, PROVIDE TYP ML1 LINTEL AND SEE LOOSE LINTEL SCHEDULE FOR SIZE OF ANGLE.
6. ALL EXTERIOR LINTELS SHALL BE HOT-DIPPED GALVANIZED.
7. STEEL FABRICATOR TO INSTALL WIRE TIES TO BEAM DURING LINTEL FABRICATION. COORDINATE LOCATION AND SPACING WITH MASONRY CONTRACTOR.

19 S400 TYPICAL LOAD BEARING LINTELS
3/4" = 1'-0"



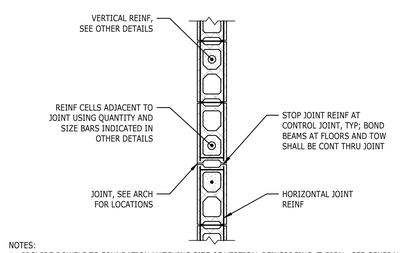
NOTES:
1. THIS SCHEDULE APPLIES TO OPENINGS IN ALL NON-LOAD BEARING WALLS AND PARTITIONS.
2. SEE ARCHITECTURAL DRAWINGS FOR SIZE AND LOCATIONS OF OPENINGS.
3. PROVIDE 8" OF BEARING AT EACH END OF ALL OPENINGS.
4. DO NOT PLACE CONTROL JOINT IN CMU LINTEL OR WITHIN 8" OF JAMB.

12 S400 NON-BEARING LINTEL SCHEDULE
3/4" = 1'-0"



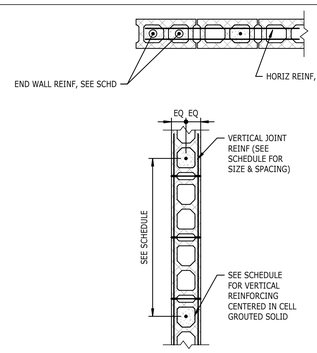
NOTE:
1. WALL REINFORCEMENT PER SCHEDULE.
2. CONTRACTOR MAY EMPLOY INTERSECTION DETAILING HEREIN WHEN SEQUENCING OR BLOCK COURSING PROHIBITS INTERLOCKED CONSTRUCTION.

11 S400 TYPICAL NON-BEARING WALL INTERSECTION
1" = 1'-0"



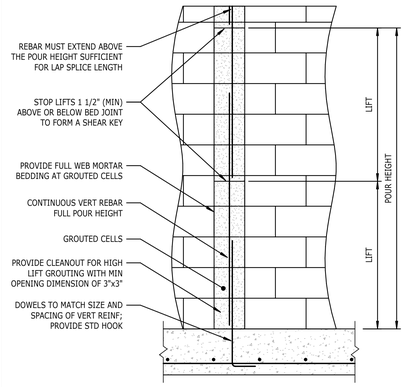
NOTES:
1. PROVIDE DOWELS TO FOUNDATION MATCHING SIZE OF VERTICAL REINFORCING, TYPICAL. SEE GENERAL NOTES OR MINIMUM SPLICE AND EMBEDMENT LENGTH SCHEDULE FOR LAP REQUIREMENTS.
2. ALL CONTROL JOINT LOCATIONS SHALL BE COORDINATED WITH THE ARCHITECTURAL DRAWINGS. FOR INTERIOR PARTITION WALLS, JOINTS SHALL HAVE A MAXIMUM SPACING DETERMINED FROM THE LESSER OF 1 1/2 TIMES THE WALL HEIGHT AND 25 FEET. FOR STRUCTURAL WALLS, CONTACT THE ENGINEER OF RECORD IF JOINTS ARE NOT LOCATED ON PLAN.
3. MASONRY WALL CONTROL JOINTS SHALL NOT BE LOCATED WITHIN 24" OF THE EDGES OF WALL OPENINGS.
4. DO NOT INSTALL CONTROL JOINTS IN STAIR OR ELEVATOR CORE WALLS.
5. MASONRY WALL CONTROL JOINTS DO NOT NECESSARILY ALIGN WITH VENEER CONTROL JOINT LOCATIONS. DO NOT INSTALL MASONRY WALL CONTROL JOINTS ONLY AT VENEER JOINT LOCATIONS.
6. WHERE A CONTROL JOINT OCCURS WITHIN A MASONRY SHEAR WALL, END WALL REINFORCING MUST BE INSTALLED ON EACH SIDE OF THE JOINT.

7 S400 TYPICAL MASONRY WALL CONTROL JOINT
3/4" = 1'-0"



PLAN 8" CMU

8 S400 TYPICAL WALL REINFORCING
3/4" = 1'-0"



GENERAL GROUTING REQUIREMENTS:
1. ALL REINFORCED CELLS SHALL BE GROUTED SOLID.
2. REINFORCING BARS SHALL BE IN PROPER POSITION PRIOR TO PLACEMENT OF GROUT, NOT PUSHED DOWN INTO PREVIOUSLY PLACED GROUT. SAME REQUIREMENT APPLIES FOR EMBEDDED BOLTS AND FASTENERS.
3. MORTAR BEDDING UNDER THE FIRST COURSE OF BLOCK CELLS TO BE GROUTED SHALL PERMIT GROUT TO COME INTO DIRECT CONTACT WITH FOUNDATION.
4. PLACE MORTAR ON CROSS WEBS ADJACENT TO ALL GROUTED CELLS.
5. MORTAR THAT PROJECTS MORE THAN 1/2" INTO CELLS THAT ARE TO BE GROUTED SHALL BE REMOVED.
6. GROUTED CELLS SHALL BE MECHANICALLY VIBRATED DURING PLACEMENT OF GROUT. TEN MINUTES AFTER PLACING GROUT, EACH GROUTED CELL SHALL BE RECONSOLIDATED WITH A VIBRATOR.
7. METAL LATH SHALL BE PLACED UNDER ALL BOND BEAMS IN ORDER TO CONTAIN GROUT. FELT OR OTHER BOND BREAKING MATERIAL IS NOT PERMITTED. AS AN ALTERNATIVE TO THIS, "U"-SHAPED LINTEL BLOCKS MAY BE USED FOR BOND BEAMS.
8. EITHER LOW LIFT GROUTING OR HIGH LIFT GROUTING PROCEDURES MAY BE UTILIZED, AT THE CONTRACTOR'S OPTION.

LOW LIFT GROUTING PROCEDURE:
1. LAY WALL TO MAXIMUM OF 5'-0".
2. CLEAN MORTAR AND OTHER DEBRIS FROM CELLS TO BE GROUTED.
3. PLACE REINFORCING BARS IN PROPER POSITION.
4. PLACE GROUT UP TO LIFT HEIGHT AND VIBRATE.

HIGH LIFT GROUTING PROCEDURE:
1. CLEANOUT OPENINGS SHALL BE PROVIDED IN THE FACE SHELLS OF THE BOTTOM COURSE OF ALL CELLS TO BE GROUTED. OPENINGS SHALL BE LARGE ENOUGH TO ALLOW REMOVAL OF DEBRIS.
2. LAY WALL TO MAXIMUM POUR HEIGHT AND CLEAN DEBRIS FROM OPENINGS. PLACE REINFORCING BARS IN PROPER POSITION.
3. CLEAN MORTAR AND OTHER DEBRIS FROM CELLS TO BE GROUTED.
4. MASONRY SHALL CURE A MINIMUM OF 4 HOURS PRIOR TO GROUTING.
5. PLACE GROUT TO THE FOLLOWING HEIGHTS: MAXIMUM LIFT HEIGHT IS 5'-0"; MAXIMUM POUR HEIGHT IS 12'-0" UNLESS EXPRESSLY COORDINATED WITH THE STRUCTURAL ENGINEER.
6. AFTER THE LIFT IS POURED, VIBRATE TO ELIMINATE ALL AIR VOIDS. WAIT BETWEEN 3 AND 10 MINUTES, THEN RECONSOLIDATE BY VIBRATING AGAIN. CONTINUE THIS PROCEDURE FOR FULL POUR HEIGHT. RECONSOLIDATE THE PRIOR LIFT BY EXTENDING THE VIBRATOR THROUGH THE CURRENT LIFT INTO THE PREVIOUS LIFT.
7. GROUT SLUMP MUST BE MAINTAINED BETWEEN 10 AND 11 INCHES FOR HIGH LIFT GROUTING.

3 S400 TYPICAL MASONRY GROUT REQUIREMENTS
3/4" = 1'-0"

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036929 KRISTEN A. BALDWIN

03/03/2025

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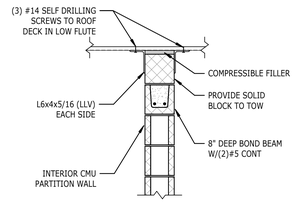
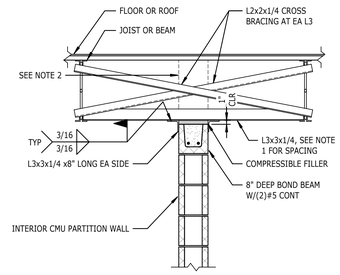
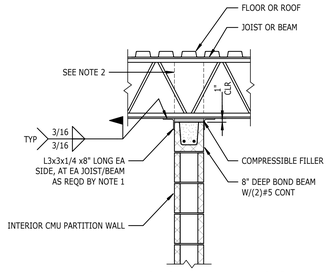


WALL TO STRUCTURE AT ROOF



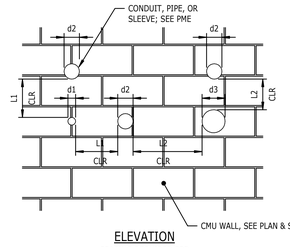
WALL BRACING WHERE FRAMING IS PARALLEL TO WALL



WALL BRACING WHERE FRAMING IS PERPENDICULAR TO WALL

NOTES:
1. TOPS OF ALL INTERIOR PARTITION WALLS SHALL BE BRACED PER THIS DETAIL AT A SPACING NOT TO EXCEED 24'-0" FOR 8" CMU OR LARGER, 18'-0" FOR 6" CMU, AND 12'-0" FOR 4" CMU. INTERSECTING WALLS BUILT WITH INTERLOCKING BLOCKS OR DETAILED PER THE TYPICAL INTERSECTION AT NON-LOAD BEARING WALLS DETAIL (NOT EXCEEDING THE SPACING NOTED) MAY ALSO BE CONSIDERED TO BRACE THE PARTITION.
2. SEE ARCHITECTURAL DRAWINGS FOR TOP OF WALL ELEVATIONS.
3. USE L2x2x1/4 FOR LENGTHS LESS THAN 6'-0", L3x3x1/4 FOR LENGTHS UP TO 9'-0", AND L4x4x1/4 FOR LENGTHS UP TO 12'-0".

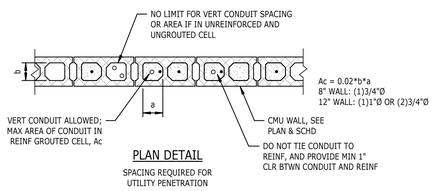
5 S401 TYPICAL INTERIOR PARTITION BRACING
3/4" = 1'-0"



d1 < d2 < d3
L1 = 3*d2
L2 = 3*d3

d = DIAMETER OF PENETRATION
L = CLEAR SPACING

ELEVATION
SPACING REQUIRED FOR UTILITY PENETRATION

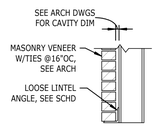


PLAN DETAIL
SPACING REQUIRED FOR UTILITY PENETRATION

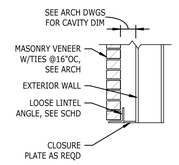
NOTES:
1. REFER TO PME DRAWINGS FOR ALL TELECOM, CONDUIT, AND PIPES 8"Ø AND SMALLER. CONTRACTOR TO FOLLOW DETAIL SPACING REQUIREMENTS FOR LAYOUT. IF SPACING CANNOT BE MAINTAINED, PENETRATIONS MUST BE GROUPED BELOW CMU LINTEL. SEE ADDITIONAL TYPICAL DETAILS.
2. CONDUITS SHALL NOT PENETRATE BOND BEAMS NOR LINTELS.
3. PIPES WITH LIQUID, GAS, OR VAPORS HIGHER THAN 150°F ARE NOT PERMITTED VERTICALLY WITHIN WALLS.
4. PIPES WITH PRESSURE IN EXCESS OF 55 PSI ARE NOT PERMITTED VERTICALLY WITHIN WALLS.
5. PIPES WITH WATER OR LIQUID SUBJECT TO FREEZING ARE NOT PERMITTED VERTICALLY WITHIN WALLS.

1 S401 ALLOWABLE WALL CONDUIT PENETRATIONS
3/4" = 1'-0"

STEEL LOOSE LINTEL ANGLE SUPPORTING MASONRY VENEER	
CLEAR OPENING	LOOSE LINTEL ANGLE
UP TO 5'-0"	L4x4x3/8
5'-1" TO 8'-0"	L6x4x3/8 (LLV)
8'-1" TO 10'-0"	L7x4x3/8 (LLV)
10'-1" TO 12'-0"	L8x4x1/2 (LLV)



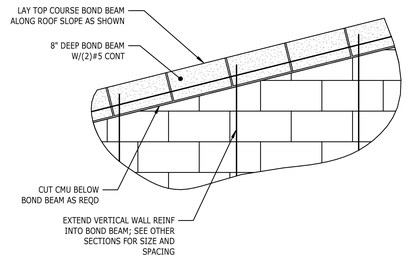
WITHOUT CLOSURE PLATE



WITH CLOSURE PLATE

NOTES:
1. ALL LOOSE LINTELS SHALL BE PAINTED OR GALVANIZED, SEE ARCHITECTURAL DRAWINGS.
2. PROVIDE 6" MINIMUM BEARING FOR OPENINGS UP TO 8'-0" WIDE. PROVIDE 8" MINIMUM BEARING FOR OPENINGS OVER 8'-0" WIDE.
3. SEE ARCHITECTURAL DRAWINGS FOR ANGLE PLACEMENT AND FLASHING.
4. LOOSE LINTEL ANGLES ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS. SEE ARCHITECTURAL DRAWINGS FOR ALL LOCATIONS OF OPENINGS REQUIRING ANGLES.
5. FOR CLEAR OPENING DIMENSIONS GREATER THAN THOSE SHOWN IN THE SCHEDULE, SEE OTHER DETAILS OR CONTACT THE ENGINEER OF RECORD.

7 S401 STEEL LOOSE LINTEL SCHEDULE
3/4" = 1'-0"



4 S401 TYPICAL SLOPED BOND BEAM
3/4" = 1'-0"

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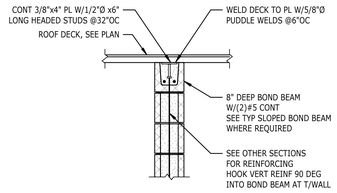
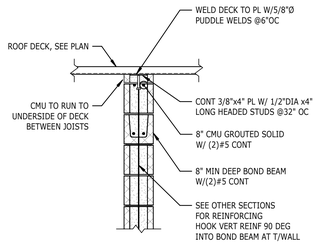
SHEET NUMBER

S401



9 S402 TYPICAL ROOF DECK TO SHEAR WALL DETAIL
3/4" = 1'-0"



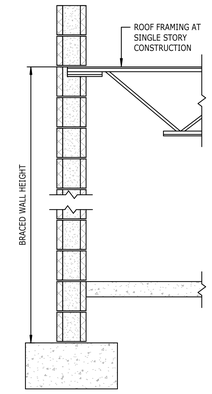
10 S402 TYPICAL ROOF DECK TO SHEAR WALL DETAIL
3/4" = 1'-0"

MASONRY WALL SCHEDULE				
	BRACED WALL HEIGHT	VERTICAL REINFORCING		HORIZONTAL REINFORCING
		8" CMU		
		VERTICAL REINFORCING	END WALL REINFORCING	
EXTERIOR, BEARING, AND NON-CANTILEVERED WALLS	UP TO 23'-0"	#5@32"OC	(2)#6	9 GA LADDER TYPE @16"OC
WALLS AT CANOPY OUTRIGGERS	UP TO 23'-0"	#6@24"OC	(2)#6	9 GA LADDER TYPE @16"OC
ALL OTHER WALLS SPANNING VERTICALLY	UP TO 16'-0"	#4@48"OC	(1)#4	9 GA LADDER TYPE @16"OC
	OVER 16'-0" TO 23'-0"	#5@48"OC	(1)#6	9 GA LADDER TYPE @16"OC

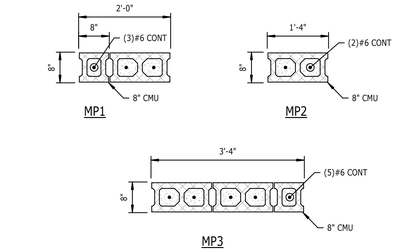
NOTES:
1. PROVIDE DOWELS EXTENDING INTO FOUNDATIONS FOR ALL VERTICAL REINFORCING BARS. SIZE AND LOCATION OF DOWELS TO MATCH VERTICAL REINFORCING.
2. DRILL AND SET IN ADHESIVE ALL VERTICAL REINFORCING FOR INTERIOR NON-BEARING WALLS WITH 2 1/2" EMBED INTO CONCRETE SLAB.
3. ALL NON-LOAD BEARING, NON-SHEAR WALLS, INTERIOR PARTITION WALLS SHALL SPAN EITHER VERTICALLY OR HORIZONTALLY. SEE GUIDELINES BELOW FOR HORIZONTAL AND VERTICAL SPANNING WALLS IN DETAILS.
4. REFER TO PLAN FOR SHEAR WALL LOCATIONS. ENDS OF SHEAR WALLS OCCUR AT WALL INTERRUPTIONS DUE TO COLUMNS, WINDOWS, DOORS, END OF WALLS, CONTROL JOINTS, EXPANSION JOINTS, ETC. REFER TO DETAILS FOR END OF WALL REINFORCING.
5. PROVIDE (2)#5 BARS IN BOND BEAM AT TOPS OF WALLS AND AS INDICATED IN SECTIONS AND SCHEDULES.
6. ALL MASONRY TO BE CONSTRUCTED IN RUNNING BOND BEAM PATTERN WITH INTERLOCKING CORNERS.
7. CONTROL JOINTS ARE TO BE TREATED AS 'END OF WALL' FOR LAYOUT OF REINFORCING.

VERTICAL SPANNING WALLS:
1. ALL VERTICAL SPANNING WALLS ARE TO BE ANCHORED TO STEEL STRUCTURE PER OTHER DETAILS.
2. ALL WALLS NOT EXTENDING TO STRUCTURE SHALL BE LATERALLY BRACED IN ACCORDANCE WITH OTHER DETAILS.

1 S402 WALL REINFORCING SCHEDULE
3/4" = 1'-0"

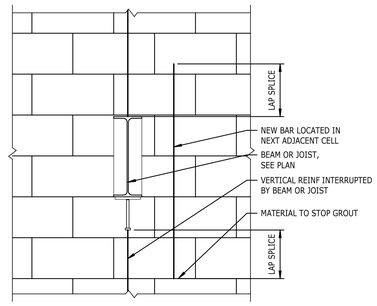


WALL SECTION
SINGLE-STORY

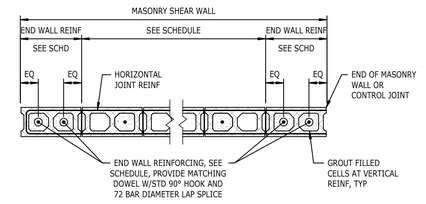


NOTES:
1. ALL DIMENSIONS SHOWN ARE NOMINAL DIMENSIONS.
2. SEE MINIMUM SPLICE AND EMBEDMENT LENGTH SCHEDULE FOR LAP REQUIREMENTS.
3. GROUT CELLS SOLID.
4. DOWELS INTO FTG TO MATCH VERT REINF.

11 S402 TYPICAL MASONRY PILASTERS
3/4" = 1'-0"

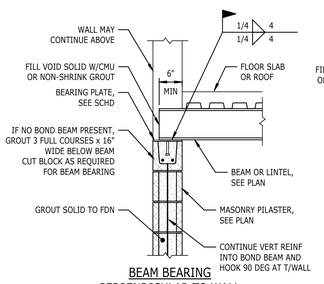


7 S402 TYPICAL INTERRUPTED REINFORCING
1" = 1'-0"

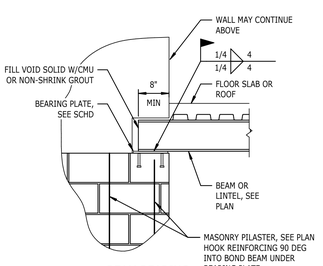


NOTES:
1. ALTERNATE COURSES (LAY BLOCK IN RUNNING BOND).
2. SEE SHEAR WALL SCHEDULE FOR HORIZONTAL REINFORCING.
3. AT 12" CMU BARS MAY BE DOUBLE. TWO BARS PER CELL IS A BAR "SET".

3 S402 TYPICAL SHEAR WALL REINFORCING
3/4" = 1'-0"



BEAM BEARING
PERPENDICULAR TO WALL



BEAM BEARING
PARALLEL TO WALL

BEARING PLATE SCHEDULE				
MARK	THICKNESS	WIDTH	LENGTH	# OF x6" LONG HEADED STUDS
CASE 1	1/2"	7"	7"	(2)1/2"Ø
CASE 2	3/4"	7"	12"	(4)1/2"Ø

CASE 1 = AT JOIST, BEAMS NOT SUPPORTING OTHER BEAMS, AND LINTELS BEARING ON 8" WALLS.

CASE 2 = AT BEAMS SUPPORTING JOISTS OR OTHER BEAMS BEARING ON 8" WALLS.

4 S402 TYPICAL STEEL JOIST/BEAM BEARING
3/4" = 1'-0"

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RICHMOND COMMUNITY COLLEGE

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BID DOCUMENTS

CMU DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036929 KRISTEN A. BALDWIN METTER

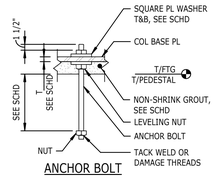
03/03/2025

SHEET NUMBER

S402

STEEL COLUMN SCHEDULE					
LEVEL 3					LEVEL 3
23'-0"	HSS8x8x3/8	HSS8x8x3/8	HSS8x8x3/8	HSS8x8x3/8	23'-0"
02 LOW ROOF					02 LOW ROOF
9'-9 1/4"					9'-9 1/4"
FFE					FFE
0"					0"
Column Locations	A-1	A-2	B-2	C-1	

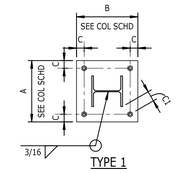
1 S500 STEEL COLUMN SCHEDULE
1/8" = 1'-0"



ANCHOR BOLT

BOLT SIZE	3/4"Ø	1"Ø	1 1/4"Ø	1 1/2"Ø	1 3/4"Ø	2"Ø
BOLT GRADE (KSI)	36	36	36	55	55	55
DIMENSION "C"	1 1/2"	2"	2"	2 1/4"	2 1/2"	2 3/4"
SQUARE PL WASHER SIZE	1/4"x2"	3/8"x3"	1/2"x3"	1/2"x3 1/2"	5/8"x4"	3/4"x5"
GROUT THICKNESS	2"	2"	2"	3"	3"	3"
TIGHTENING CLEARANCE "C1"	1 3/16"	1 3/8"	1 13/16"	2"	NA	NA

NOTES:
1. "C1" DIMENSION IS MINIMUM FOR BASE PLATE SIZE. DETAILER TO LAYOUT ANCHOR BOLTS BASED ON "C" DIMENSION FROM EDGE OF BASE PLATE DIMENSION IN COLUMN SCHEDULE.



TYPE 1

STEEL COLUMN BASE PLATE SCHEDULE					
LOCATION	SIZE	BASE PLATE SIZE	ANCHOR BOLTS	PATTERN TYPE	EMBEDMENT DEPTH
A-1	HSS8x8x3/8	3/4"x14"x14"	(4)3/4"Ø	1	9"
A-2	HSS8x8x3/8	3/4"x14"x14"	(4)3/4"Ø	1	9"
B-2	HSS8x8x3/8	3/4"x14"x14"	(4)3/4"Ø	1	9"
C-1	HSS8x8x3/8	3/4"x14"x14"	(4)3/4"Ø	1	9"

2 S500 STEEL COLUMN BASE PLATE SCHEDULE
3/4" = 1'-0"

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STEEL FRAMING DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

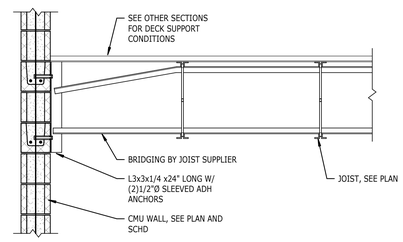
REVISIONS
NO: DATE: DESCRIPTION:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036929 ROBERT A. BALDWIN

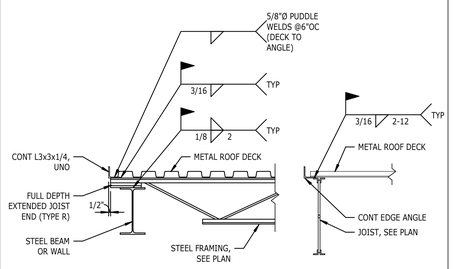
03/03/2025

SHEET NUMBER

S500

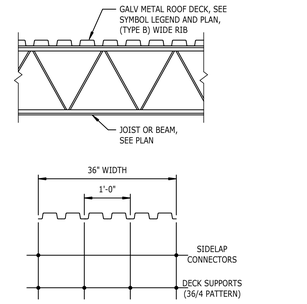


9 S510 TYPICAL JOIST BRIDGING
3/4" = 1'-0"



NOTES:
1. SEE OTHER DETAILS FOR INFORMATION NOT SHOWN.

5 S510 TYPICAL EDGE OF DECK
3/4" = 1'-0"

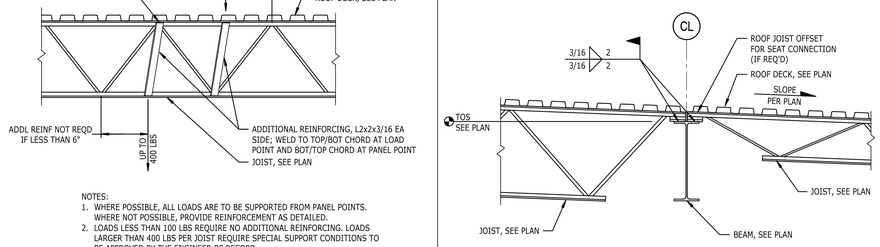


ROOF DECK ATTACHMENT DETAIL

NOTES:
1. ATTACH DECK TO SUPPORTING MEMBERS WITH SELF-DRILLING SELF-TAPPING HEX WASHER HEAD SCREWS. USE #12-24 FOR DECK ATTACHMENT TO SUPPORTS AND #10-16 FOR SIDELAP ATTACHMENT.
2. AT DECK BEARING SUPPORTS, PROVIDE SCREWS @12"OC (36/4 PATTERN).
3. AT SUPPORTS PARALLEL TO DECK SPAN, PROVIDE SCREWS @12"OC, TYPICAL.
4. AT DECK SIDELAPS/PERIMETER EDGE, PROVIDE SCREWS @12"OC, TYPICAL. WELDING OF SIDELAPS IS NOT PERMITTED.
5. ALL DECK ENDS TO BE LAPPED ON BOTH ENDS. DO NOT BUTT JOINTS.
6. DECK SECTION MINIMUM PROPERTIES: SEE TABLE BELOW.
7. DECK SHALL BE CONTINUOUS OVER (2) OR MORE SPANS, TYPICAL.
8. 5/8"Ø PUDDLE WELDS MAY BE USED FOR DECK ATTACHMENT TO SUPPORTS AT SAME SPACING SPECIFIED ABOVE. SIDELAP FASTENING MUST BE SCREWED AS DESCRIBED ABOVE.
9. CONTRACTOR OPTION TO SUBMIT MECHANICAL FASTENERS BY HILTI, SIMPSON STRONG-TIE, OR APPROVED EQUAL. SUBSTITUTION REQUESTS FOR PRODUCTS MAY BE SUBMITTED BY THE CONTRACTOR TO THE ENGINEER-OF-RECORD (EOR) FOR REVIEW. SUBSTITUTIONS WILL ONLY BE CONSIDERED FOR PRODUCTS THAT MEET THE CODE REQUIREMENTS FOR DECK ATTACHMENT, POSSESS A FM GLOBAL APPROVAL AND POSSESS A CODE REPORT (ICC-ES) RECOGNIZING THE PRODUCT FOR THE APPROPRIATE APPLICATION. SUBSTITUTION REQUESTS SHALL INCLUDE CALCULATIONS THAT DEMONSTRATE THE SUBSTITUTED PRODUCT IS CAPABLE OF ACHIEVING THE EQUIVALENT PERFORMANCE VALUES OF THE DESIGN BASIS PRODUCT. CONTRACTOR SHALL CONTACT MANUFACTURER'S REPRESENTATIVE FOR PRODUCT INSTALLATION TRAINING AND A LETTER SHALL BE SUBMITTED TO THE EOR INDICATING TRAINING HAS TAKEN PLACE. FASTENERS SHALL BE COLLATED AND INSTALLED USING THE MANUFACTURER'S DELIVERY TOOL AND FOLLOWING MANUFACTURER'S INSTRUCTIONS.

DECK TYPE	DESIGN THICKNESS (in)	DECK WEIGHT (psf)	I_p (in⁴/ft)	S_p (in³/ft)	I_n (in⁴/ft)	S_n (in³/ft)	V_a (lbs/ft)	F_y (ksi)
B18	0.0474	2.82	0.289	0.318	0.295	0.327	2870	33

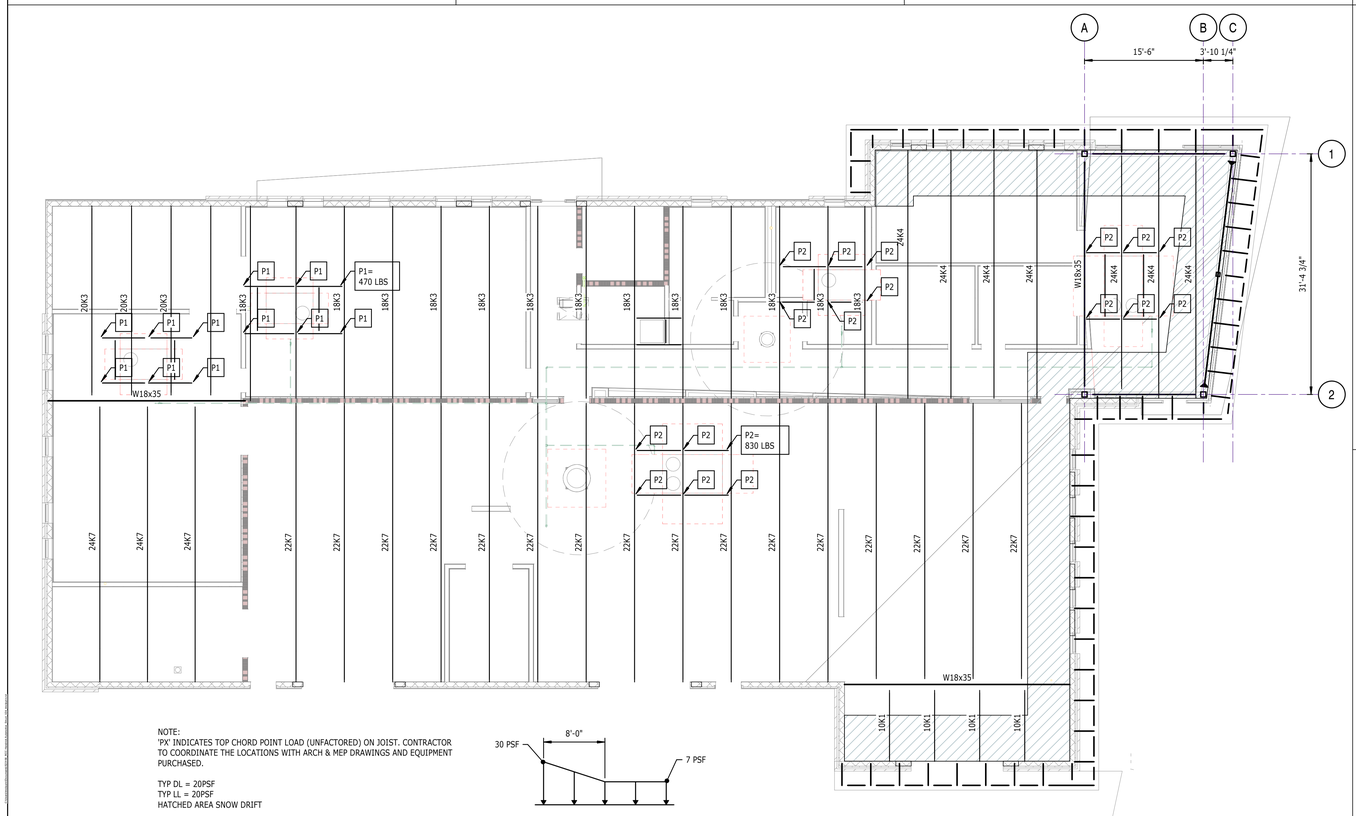
1 S510 TYPICAL 1 1/2" METAL ROOF DECK
3/4" = 1'-0"



NOTES:
1. WHERE POSSIBLE, ALL LOADS ARE TO BE SUPPORTED FROM PANEL POINTS. WHERE NOT POSSIBLE, PROVIDE REINFORCEMENT AS DETAILED.
2. LOADS LESS THAN 100 LBS REQUIRE NO ADDITIONAL REINFORCING. LOADS LARGER THAN 400 LBS PER JOIST REQUIRE SPECIAL SUPPORT CONDITIONS TO BE APPROVED BY THE ENGINEER OF RECORD.
3. BOTTOM CHORDS EXTENDING UNSUPPORTED PAST THE FIRST BOTTOM PANEL POINT TOWARD JOIST BEARING LOCATION ARE NOT TO BE USED TO SUPPORT ANY LOAD WITHOUT WRITTEN PERMISSION FROM THE ENGINEER OF RECORD.

10 S510 TYPICAL JOIST REINFORCING AT POINT LOADS
3/4" = 1'-0"

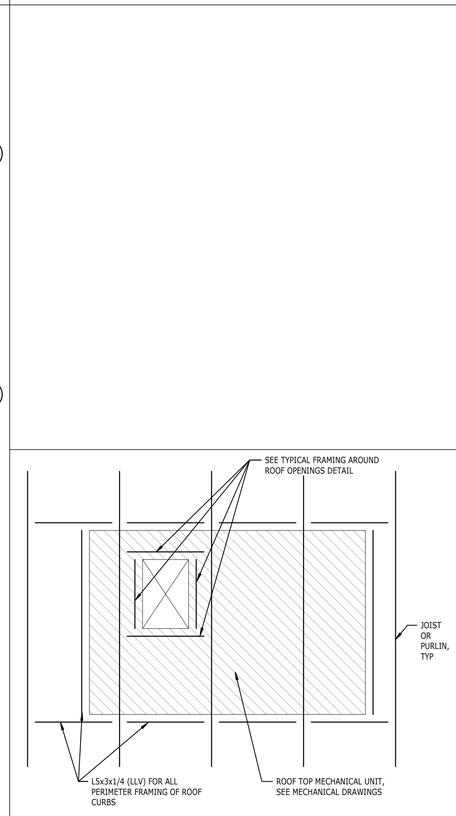
6 S510 TYPICAL JOIST BEARING
3/4" = 1'-0"



NOTE:
'PX' INDICATES TOP CHORD POINT LOAD (UNFACTORED) ON JOIST. CONTRACTOR TO COORDINATE THE LOCATIONS WITH ARCH & MEP DRAWINGS AND EQUIPMENT PURCHASED.

TYP DL = 20PSF
TYP LL = 20PSF
HATCHED AREA SNOW DRIFT

11 S510 JOIST POINT LOAD KEY PLAN
1/8" = 1'-0"

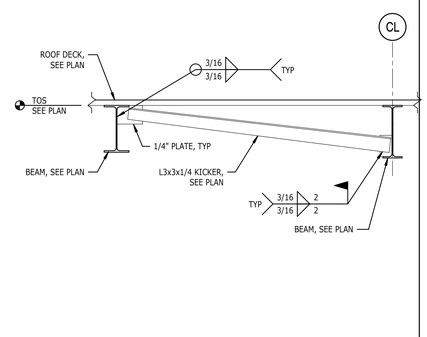


NOTES:
1. PROVIDE ANGLE FRAMING AROUND ALL OPENINGS LARGER THAN 10"x10" (10"Ø).

3 S510 TYPICAL FRAMING AT 1 1/2" DECK OPENINGS
3/4" = 1'-0"

NOTES:
1. ALL MEMBERS NOT SIZED ON FRAMING PLAN SHALL BE L5x3x1/4.

8 S510 TYPICAL MECHANICAL RTU FRAMING
3/4" = 1'-0"



4 S510 TYPICAL BEAM BOTTOM FLANGE BRACING
3/4" = 1'-0"

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STEEL ROOF DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

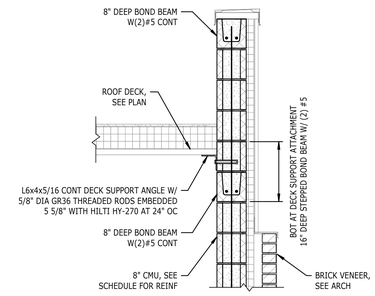
REVISIONS
NO: DATE: DESCRIPTION:

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036929 KRISTEN A. BALDWIN METZER

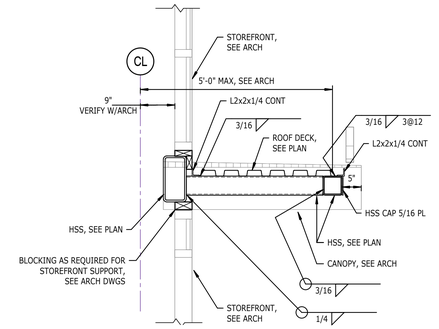
03/03/2025

SHEET NUMBER

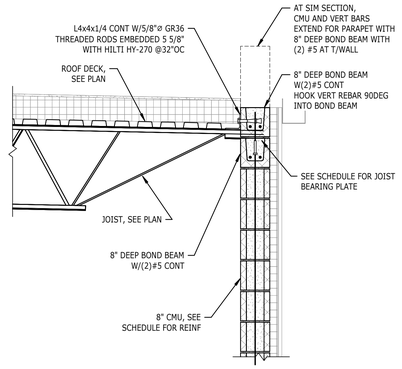
S510



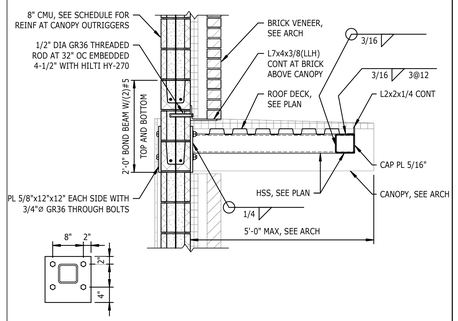
5 SECTION
S511 3/4" = 1'-0"



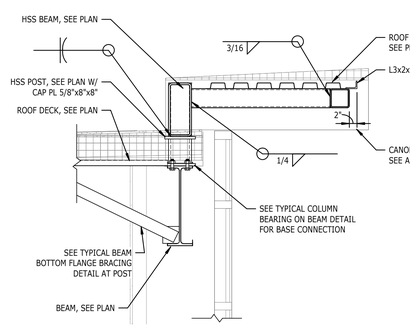
1 SECTION
S511 3/4" = 1'-0"



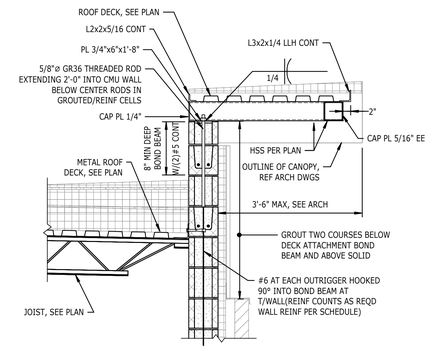
6 SECTION
S511 3/4" = 1'-0"



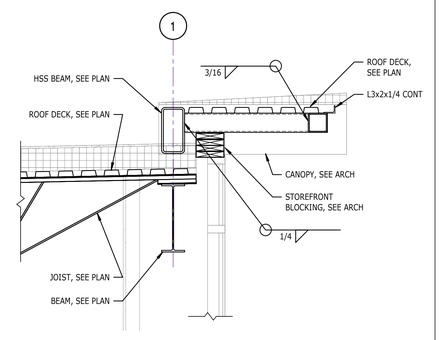
2 SECTION
S511 3/4" = 1'-0"



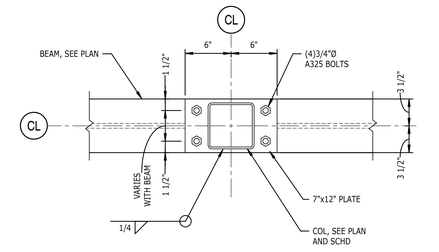
7 SECTION
S511 3/4" = 1'-0"



3 SECTION
S511 3/4" = 1'-0"



8 SECTION
S511 3/4" = 1'-0"



4 TYPICAL COLUMN BEARING ON BEAM
S511 NTS

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STEEL ROOF DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

NORTH CAROLINA PROFESSIONAL SEAL 036929 ENGINEER KRISTEN A. BALDWIN METZER

03/03/2025

SHEET NUMBER

S511

SANITARY WASTE, VENT & STORM DRAIN PIPING

1. BELOW GRADE PIPING AND JOINTS: PROVIDE SERVICE WEIGHT CAST IRON HUB AND SPIGOT PIPE (ASTM A 74) WITH COMPRESSION JOINTS (CISPI HSN) AND NEOPRENE GASKETS (ASTM C 564) OR NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (HEAVY DUTY, ASTM C1540-15) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D 2665) WITH SOLVENT WELD JOINTS (ASTM D2855). INSTALL PLASTIC PIPE BELOW GRADE PER ASTM D2321. FOAM CORE PVC PIPING IS NOT APPROVED. NOTE: PROVIDE CAST IRON PIPING SPECIFIED ABOVE FOR MECHANICAL ROOM DRAIN PIPING, PVC IS NOT ACCEPTABLE IN THESE AREAS.
2. ABOVE GRADE PIPING AND JOINTS: PROVIDE SERVICE WEIGHT CAST IRON NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET AND STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (HEAVY DUTY, ASTM C1540-15).
3. SLOPE WASTE AND STORM DRAIN PIPING AT 1/4" PER FOOT MINIMUM FOR PIPING 2-1/2" AND SMALLER AND 1/8" PER FOOT MINIMUM FOR PIPING 3" AND LARGER UNLESS NOTED OTHERWISE.
4. PROVIDE CLEAN-OUTS AT EVERY TURN IN PIPING IN EXCESS OF 45° AND SPACED WITH-IN 100'-0" APART IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS.
5. PROVIDE FLOOR CLEANOUTS (FCO) WITH TOPS DESIGNED TO MATCH SPECIFIC FLOOR FINISHES SUCH AS CARPET, TILE, ETC. PROVIDE YARD CLEANOUTS (YCO) ENCASED IN AN 18"x18"x6" CONCRETE PAD.
6. WHERE WASTE PIPING IS EXPOSED IN REST ROOM AREAS, PROVIDE CHROME PLATED BRASS PIPING, REMOVABLE P-TRAPS, MATCHING STOPS AND ESCUTCHEONS FOR ALL LAVATORIES.
7. WASTE AND VENT SYSTEMS SHALL BE TESTED AND PROVED WATER TIGHT UNDER A HEAD PRESSURE OF NO LESS THAN 10 FT. THIS PRESSURE SHALL BE HELD FOR A PERIOD OF NO LESS THAN 15 MINUTES.

DOMESTIC WATER PIPING

1. BELOW GRADE PIPING AND JOINTS: PROVIDE TYPE 'K' SOFT ANNEALED SEAMLESS COPPER TUBING (ASTM B 88) WITH NO JOINTS FOR PIPING 1" AND SMALLER. FOR PIPING 1-1/4" AND SMALLER, PROVIDE TYPE 'K' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18) WITH BCUP SILVER/PHOSPHORUS/COPPER BRAZED JOINTS (AWS A5.8). PROVIDE DUCTILE IRON PIPE AND FITTINGS (AWWA C151, AWWA C110) WITH RUBBER GASKET JOINTS AND RODS (AWWA C111) FOR PIPING 4" AND LARGER.
2. ABOVE GRADE PIPING AND JOINTS: PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18). JOINTS 2" AND SMALLER SHALL BE LEAD FREE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32), JOINTS 2-1/2" AND LARGER SHALL BE BCUP SILVER / PHOSPHORUS / COPPER BRAZED JOINTS (AWS A5.8). ALTERNATELY PRESS FITTINGS MAY BE USED FOR JOINTS. SEALING ELEMENTS FOR PRESS FITTINGS SHALL BE EPDM. SEALING ELEMENTS SHALL BE FACTORY INSTALLED. PRESS FITTINGS SHALL ALLOW IDENTIFICATION OF AN UNPRESSED FITTING DURING PRESSURE TESTING.
3. INSULATE PIPING ABOVE GRADE (EXCEPT EXPOSED CONNECTIONS TO PLUMBING FIXTURES) WITH GLASS FIBER INSULATION HAVING A VAPOR BARRIER AND JACKET. PIPE INSULATION SHALL HAVE A CONDUCTIVITY NOT EXCEEDING 0.27 BTUH x SQ. FT., SEE LIST BELOW FOR INSULATION THICKNESS:
   - PROVIDE 1" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1/2" THRU 1-1/4".
   - PROVIDE 1-1/2" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1-1/2" THRU 4".
   - PROVIDE 1/2" THICK INSULATION FOR COLD WATER PIPING SIZES 1/2" THRU 1-1/4".
   - PROVIDE 1" THICK INSULATION FOR COLD WATER PIPING SIZES 1-1/2" THRU 4".
4. PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD AND SHALL BE PLENUM RATED. PROVIDE PVC INSULATION JACKET FOR EXPOSED PIPING IN MECHANICAL ROOMS. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.
5. PROVIDE TWO-PIECE, BRONZE OR BRASS BODY, FULL PORT, 600 PSI WOG, BALL TYPE SHUT-OFF VALVES WITH BLOW-OUT PROOF STEMS AND ADJUSTABLE PACKING GLANDS. VALVES SHALL BE LEAD FREE PER NSF 61, ANNEX G REQUIREMENTS. INSTALL VALVES IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS.
6. PROVIDE A CHROME FINISH ON EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.
7. PROTECT COPPER PIPING AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER OR COPPER PLATED. WHERE COPPER PIPING IS CARRIED ON TRAPEZE HANGERS WITH OTHER PIPING, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL TO PREVENT CONTACT WITH DISSIMILAR OTHER METALS.
8. PROTECT COPPER PIPING AGAINST CONTACT WITH MASONRY. WHERE COPPER IS SLEEVED THROUGH MASONRY, PROVIDE COPPER OR RED BRASS SLEEVES. WHERE COPPER MUST BE CONCEALED IN OR AGAINST MASONRY PARTITIONS, PROVIDE A HEAVY COATING OF ASPHALTIC ENAMEL ON THE COPPER PIPING AND 15# ASPHALT SATURATED FELT BETWEEN THE PIPING AND THE MASONRY PARTITION.
9. PERFORM A PRESSURE TEST ON ALL WATER PIPING. FILL PIPING WITH POTABLE WATER, CAP AND SUBJECT PIPING TO A STATIC WATER PRESSURE OF 50 PSIG ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS OR PRESSURIZE PIPING WITH AIR TO AT LEAST ONE-HUNDRED (100) PSI. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED
10. STERILIZE THE DOMESTIC WATER SYSTEM IN PER THE AMERICAN WATER WORKS ASSOCIATION'S INSTRUCTIONS SPECIFICATIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
11. SLOPE WATER PIPING FOR DRAINAGE WITH DRAIN VALVES INSTALLED AT LOW POINTS.
12. BALANCE THE DOMESTIC HOT WATER CIRCULATION SYSTEM TO THE PERFORMANCE SPECIFICATIONS INDICATED ON THE PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.

NATURAL GAS PIPING

1. ABOVE GRADE PIPING AND FITTINGS : PROVIDE SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234). PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2-1/2" AND LARGER. ALTERNATELY PRESS FITTINGS MAY BE USED FOR JOINTS. COLD PRESS MECHANICAL JOINT FITTING SHALL CONFORM TO MATERIAL REQUIREMENTS OF ASTM A420 OR ASME B16.3 AND PERFORMANCE CRITERIA ANSI LC-4/CSA 6.32. SEALING ELEMENTS FOR PRESS FITTINGS SHALL BE HNBR. SEALING ELEMENTS SHALL BE FACTORY INSTALLED. PRESS FITTINGS SHALL ALLOW IDENTIFICATION OF AN UNPRESSED FITTING DURING PRESSURE TESTING. FITTINGS SHALL COMPLY TO THE REQUIREMENTS OF ASTM F3226.
2. SPACE GAS PIPING HANGER RODS 7'-0" ON CENTER MAXIMUM AND SPACE TRANSVERSE BRACING 20'-0" ON CENTER MAXIMUM. TRANSVERSE BRACING FOR ONE SECTION MAY ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED TO IT IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE. COORDINATE HANGER LOCATIONS WITH STRUCTURAL DRAWING DETAILS.
3. PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.
4. GAS PRESSURE REGULATORS SHALL COMPLY WITH ANSI Z21.80. REGULATORS SHALL BE CAST IRON OR DIE-CAST ALUMINUM CONSTRUCTION WITH INTERCHANGEABLE ZINC-PLATED STEEL SPRINGS, ZINC-PLATED STEEL DIAPHRAGM PLATE, NITRILE RUBBER SEAT DISC, INTERCHANGEABLE ALUMINUM ORIFICE, AND ULTRAVIOLET-STABILIZED MINERAL FILLED NYLON SEAL PLUG. REGULATOR SHALL BE SINGLE-PORT SELF-CONTAINED WITH ORIFICE NO LARGER THAN REQUIRED AT MAXIMUM PRESSURE INLET AND NO PRESSURE SENSING PIPING EXTERNAL TO THE REGULATOR. PRESSURE REGULATOR SHALL MAINTAIN DISCHARGE PRESSURE SETTING DOWNSTREAM AND NOT EXCEED 150 PERCENT OF DESIGN DISCHARGE PRESSURE AT SHUTOFF. OVERPRESSURE PROTECTION DEVICE SHALL BE FACTORY MOUNTED ON REGULATOR. WHEN USING VENTLESS REGULATORS, MOUNT REGULATOR IN A HORIZONTAL UPRIGHT POSITION. IF VENTED TYPE REGULATORS ARE USED, INSTALL VENT PIPING (FULL SIZE OPENING) FROM GAS PRESSURE REGULATORS TO OUTDOORS AND TERMINATE IN WEATHERPROOF HOOD.
5. PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). LABEL ALL GAS PIPING ON 5'-0" CENTERS INDICATING THE GAS PRESSURE.
   2 PSI GAS PIPING SHALL BE LABELED "2-PSI GAS"
   LOW PRESSURE GAS PIPING SHALL BE LABELED "GAS"
6. CONTACT LOCAL GAS UTILITY TO PROVIDE GAS SERVICE AND GAS METER WITH A PULSE OUTPUT COMPATIBLE WITH THE BUILDING AUTOMATION SYSTEM. COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR AND LOCAL GAS UTILITY.

PLUMBING GENERAL NOTES

1. PLUMBING WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 NORTH CAROLINA STATE PLUMBING CODE AND WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
2. SCOPE: PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETION AND OPERATION OF ALL PLUMBING SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES.
3. WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE TIME PERIOD SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE. PRIOR TO TURNING THE COMPLETED SYSTEM OVER TO THE OWNER, REVIEW THE INSTALLATION WITH THE ARCHITECT / ENGINEER AND REPLACE OR REPAIR ANY DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.
4. COORDINATE ALL PLUMBING PIPING LOCATIONS, ROUGH-IN LOCATIONS AND EQUIPMENT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. FINAL PIPING AND EQUIPMENT LOCATIONS SHALL BE A CODE COMPLIANT INSTALLATION FOR ALL TRADES.
5. FIELD VERIFY PROPER OPERATION OF EXISTING SYSTEMS BEFORE STARTING CONSTRUCTION. NOTIFY THE ARCHITECT / ENGINEER OF RECORD OF ANY PROBLEMS OR DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND EXISTING CONDITIONS AND/OR ANY POTENTIAL PROBLEMS OBSERVED BEFORE CONTINUING WORK IN THE EFFECTED AREAS.
6. PLUMBING PLANS SHALL NOT BE SCALED. REFERENCE THE ARCHITECTURAL PLANS FOR DIMENSIONS OF ALL LOCATIONS OF PLUMBING FIXTURES, FLOOR DRAINS, COLUMNS, WALLS, DOORS, ETC.
7. WHERE DISCREPANCIES ARE FOUND IN THE DRAWINGS AND SPECIFICATIONS THE MORE STRINGENT SHALL APPLY. CONTACT ENGINEER FOR CLARIFICATION.
8. ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
9. ALL VALVES, BACKFLOW PREVENTERS, BOOSTER PUMPS, ETC. SERVING THE DOMESTIC WATER SYSTEM SHALL MEET LEAD FREE STANDARDS PER ANSI/NSF 372 AND NSF 61, ANNEX G.
10. PROVIDE COMPLETE PLUMBING FIXTURES AND EQUIPMENT. INCLUDE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAIL PIECES, ESCUTCHEONS, ETC. AND INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
11. CUT WALLS, FLOORS AND CEILINGS AS REQUIRED FOR INSTALLATION OF PLUMBING WORK. ALL CUTTING SHALL BE HELD TO A MINIMUM. PATCH AND FINISH SURFACES TO MATCH ADJOINING SURFACES.
12. PIPE PENETRATIONS THRU WALLS, PARTITIONS AND FLOORS SHALL BE SLEEVED. CORE DRILLING THRU WALLS AND PARTITIONS IS PERMITTED IF PERFORMED IN A NEAT CRAFTSMAN LIKE MANNER. OPENINGS THRU WALLS, PARTITIONS, AND FLOORS SHALL BE LARGE ENOUGH FOR PIPE INSULATION TO REMAIN CONTINUOUS. PIPES PENETRATING THRU EXTERIOR WALLS SHALL BE SEALED WATER TIGHT. INSTALL ESCUTCHEONS IN ALL EXPOSED AREAS.
13. PIPING AND SPECIALTIES SHALL BE LOCATED CONCEALED IN WALLS, PARTITIONS OR ABOVE CEILINGS UNLESS NOTED OTHERWISE. PIPING IN EXPOSED AREAS SHALL BE RUN TIGHT TO UNDERSIDE OF STRUCTURE.
14. PROVIDE ACCESS DOORS FOR ALL SPECIALTIES, VALVES, WATER HAMMER ARRESTORS, TRAP PRIMERS, ETC., CONCEALED BEHIND WALLS OR CEILINGS THAT REQUIRE MAINTENANCE ACCESS.
15. DO NOT INSTALL PIPING IN AREAS SUBJECT TO FREEZING TEMPERATURES. INSTALL PIPING SHOWN IN EXTERIOR WALLS ON THE CONDITIONED SIDE OF THE WALL INSULATION.
16. PIPING, VENTS, ETC. EXTENDING THROUGH EXTERIOR WALLS AND/OR THE ROOF SHALL BE FLASHED AND COUNTER FLASHED IN A WATERPROOF MANNER. COORDINATE FLASHING WITH THE GENERAL CONTRACTOR.
17. PROVIDE A CHROME FINISH FOR ALL EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.
18. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
19. REFER TO THE STRUCTURAL PLANS AND DETAILS FOR ACCEPTABLE LOCATIONS TO ATTACH HANGERS AND SUPPORTS TO THE BUILDING STRUCTURE. HANGERS SHALL NOT ATTACH TO THE ROOF DECK.
20. PROVIDE MANUFACTURERS RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE.
21. VALVES AND OTHER PIPING ACCESSORIES REQUIRING ACCESS SHALL BE INSTALLED IN ACCESSIBLE LOCATION NO MORE THAN 18" ABOVE THE CEILING OR 2" BEHIND THE WALL, PROVIDE OFFSETS IN PIPING AS NEEDED.
22. PLUMBING SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: PLUMBING FIXTURES AND EQUIPMENT, FIRE STOPPING, SEISMIC BRACING, PIPE IDENTIFICATION, DOMESTIC WATER SYSTEM, SANITARY WASTE AND VENT SYSTEM, STORM DRAIN SYSTEM, NATURAL GAS SYSTEM.

FIRE STOPPING:

1. FIRE STOP ALL PENETRATIONS, BY PIPING OR CONDUITS, OF FIRE RATED WALLS, FLOORS AND PARTITIONS. PROVIDE A DEVICE(S) OR SYSTEM(S) WHICH HAS BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814 AND INSTALL IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE A DEVICE(S) OR SYSTEM(S) WITH AN 'F' RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED. REFER TO ARCHITECTURAL PLANS FOR WALL AND FLOOR TYPES.

SEISMIC BRACING:

1. PROVIDE DESIGN AND INSTALLATION OF SEISMIC RESTRAINT ELEMENTS FOR THE PLUMBING SYSTEM(S) IN COMPLIANCE WITH ALL APPLICABLE REQUIREMENTS OF THE 2018 NORTH CAROLINA BUILDING CODE AND ASCE 7-10, CHAPTER 13. PER APPENDIX B ON THE ARCHITECTURAL DRAWINGS, THE SITE'S SEISMIC DESIGN CATEGORY IS "C".

PIPE IDENTIFICATION:

1. PIPE IDENTIFICATION SHALL MATCH THE FACILITY'S EXISTING STANDARD. IF NO STANDARD EXISTS, THEN THE PIPE IDENTIFICATION SHALL BE IN ACCORDANCE WITH ANSI A13.1.
2. PROVIDE PIPING LABELS FOR ALL PLUMBING PIPING. PIPING LABELS SHALL BE ACRYLIC FACED, WRAP-AROUND TYPE. EACH LABEL SHALL INDICATE THE PIPING CONTENTS, DIRECTION OF FLOW AND SHALL BEAR THE MANUFACTURER'S STANDARD COLOR FOR THE SERVICE INDICATED.

SUBMITTALS:

1. PROVIDE SUBMITTALS BEARING THE CONTRACTORS REVIEW STAMP FOR ALL PLUMBING FIXTURES, PIPING, EQUIPMENT AND ACCESSORIES IN ELECTRONIC FORMAT (PDF).
2. NO PRIVATE LABELED MATERIALS WILL BE ACCEPTED AS EQUALS TO PRODUCTS SPECIFIED HEREIN.
3. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SUBSTITUTIONS TO SPECIFIED PLUMBING FIXTURES AND EQUIPMENT INCLUDING BUT NOT LIMITED TO; PROVIDING MAINTENANCE ACCESS CLEARANCE, PIPING, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC. AND ANY MODIFICATIONS TO ASSOCIATED MECHANICAL, ELECTRICAL OR PLUMBING SYSTEMS REQUIRED BY THE EQUIPMENTS INSTALLATION INSTRUCTIONS. ALL COSTS ASSOCIATED WITH SUBSTITUTIONS SHALL BE INCLUDED IN THE ORIGINAL BASE BID.

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
	CW	COLD WATER PIPING
	HW	HOT WATER PIPING
	HWR	HOT WATER RETURN PIPING
	W	SANITARY WASTE PIPING
	V	SANITARY VENT PIPING
SD	SD	STORM DRAIN PIPING
G	G	NATURAL GAS PIPING
D	D	DRAIN PIPING (INDIRECT)
	-	PIPING ELBOW DOWN
	-	PIPING ELBOW UP
	-	PIPING CONTINUES
	-	BALL VALVE
	-	CHECK VALVE
	-	BALANCING VALVE
	-	GAS VALVE
	PRV	PRESSURE REDUCING VALVE
	-	IN-LINE PUMP
	-	PIPING REDUCER
	FCO	FLOOR CLEANOUT
	YCO	YARD CLEANOUT
	WCO	WALL CLEANOUT
	FD	FLOOR DRAIN
	HB	HOSE BIBB / WALL HYDRANT
SA-#	SA-#	SHOCK ARRESTOR - SUFFIX INDICATES PDI SIZE

ADDITIONAL ABBREVIATIONS

ABV	ABOVE	IW	INDIRECT WASTE
AFF	ABOVE FINISHED FLOOR	KW	KILOWATT
AFG	ABOVE FINISHED GRADE	LAV	LAVATORY
BFF	BELOW FINISHED FLOOR	MBH	1,000 BRITISH THERMAL UNIT / HOUR
CFH	CUBIC FEET PER HOUR	MFG	MANUFACTURER
CLG	CEILING	PSI	POUNDS PER SQUARE INCH
CONT	CONTINUATION	SF	SQUARE FEET
DFU	DRAINAGE FIXTURE UNIT (WASTE)	T&P	TEMPERATURE AND PRESSURE
DN	DOWN	TW	TEMPERED WATER
EX / (E)	EXISTING	TYP	TYPICAL
FFE	FINISHED FLOOR ELEVATION	UG	UNDERGROUND
FIN	FINISH	VB	VACUUM BREAKER
FR	FROM	VTR	VENT THRU ROOF
FU	FIXTURE UNITS	WC	WATER COLUMN
GPF	GALLONS PER FLUSH		
GPM	GALLONS PER MINUTE	EC	ELECTRICAL CONTRACTOR
HP	HORSE POWER	GC	GENERAL CONTRACTOR
INV	INVERT ELEVATION	MC	MECHANICAL CONTRACTOR
		PC	PLUMBING CONTRACTOR

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - PLUMBING SUMMARY

C401 METHOD OF COMPLIANCE

- ■ 2018 NCECC CHAPTER 4
- ☐ ASHRAE 90.1-2013 PRESCRIPTIVE
- ☐ ASHRAE 90.1-2013 PERFORMANCE
- ☐ COMCHECK PROVIDED (2018 NCECC)
- ☐ COMCHECK PROVIDED (90.1-2013)
- ☐ ENERGY MODELING DATA PROVIDED
- ☐ N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- ☐ C406.2 EFFICIENT MECH EQUIPMENT
- ■ C406.3 REDUCED LTG DENSITY
- ☐ C406.4 ENHANCED LTG CONTROLS
- ☐ C406.5 ON-SITE RENEWABLE ENERGY
- ☐ C406.6 DEDICATED OA SYSTEM
- ☐ C406.7 SERVICE WATER HEATING

TABLE C404.2 - MINIMUM PERFORMANCE OF WATER HEATING EQUIPMENT

EQUIPMENT TYPE	SIZE CATEGORY (INPUT)	SUB CATEGORY OR RATING CONDITION	PERFORMANCE REQUIRED a,b	REQ'D EFFICIENCY	SPECIFIED EQPM
INSTANTANEOUS WATER HEATERS, GAS	> 155,000 BTU/H	≥4000 BTU/H/GAL ≥10 GAL	80% e_t (Q/800+110 √ V)SL, BTU/H	*80%*	*96%*

a. ENERGY FACTOR (EF) AND THERMAL EFFICIENCY (E_t) ARE MINIMUM REQUIREMENTS. IN THE EF EQUATION V IS THE VOLUME IN GALLONS.
b. STANDBY LOSS (SL) IS THE MAXIMUM BTU/H BASED ON A NOMINAL 70° TEMPERATURE DIFFERENCE BETWEEN STORED WATER AND AMBIENT REQUIREMENTS. IN THE SL EQUATION Q IS THE NAMEPLATE INPUT RATE IN BTU/H. IN THE EQUATIONS FOR ELECTRIC WATER HEATERS, V IS THE RATED VOLUME IN GALLONS AND V_m IS THE MEASURED VOLUME IN GALLONS. IN THE SL EQUATION FOR GAS WATER HEATERS AND BOILERS, V IS THE RATED VOLUME IN GALLONS.
c. REFER TO WATER HEATER SCHEDULES FOR SPECIFIED WATER HEATING EQUIPMENT TYPES, CAPACITIES (STORAGE VOLUME) AND ENERGY INPUTS (ELECTRIC AND/OR GAS)

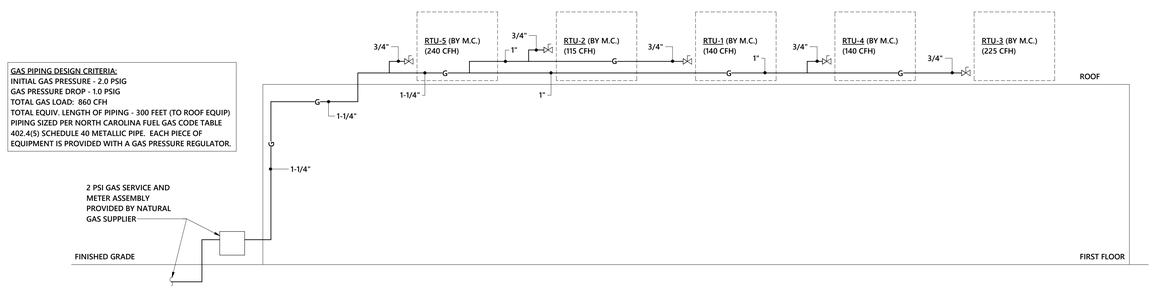
C408 - SYSTEM COMMISSIONING

- ■ BUILDING IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.
- ☐ BUILDING IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

PLUMBING LOAD SUMMARY

LOAD	FIXTURE UNITS	FLOW
SANITARY WASTE	41 DFU	-
DOMESTIC WATER	66 FU	56.2 GPM
NATURAL GAS - 2 PSI GAS SERVICE	-	860 CFH

PLUMBING SHEET INDEX



1 NATURAL GAS RISER DIAGRAM
NOT TO SCALE

Opt # 23-0128

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3/3/25

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BID DOCUMENTS

PLUMBING LEGEND, INDEX, AND NOTES

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
P001

PLUMBING SPECIALTIES SCHEDULE

SYMBOL	DESCRIPTION	CONNECTION SIZE W	V	CW	HW	SPECIFICATION	REMARKS
SA-x	SHOCK ARRESTOR, SUFFIX INDICATES PDI SIZE	-	-	x	-	EQUIPMENT: SIOUX CHIEF 650 SERIES, SIZES 1/2" THRU 2", NSF 61 CERTIFIED.	SEE SHOCK ARRESTOR TABLE THIS SHEET
HB1	HOSE BIBB, INTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, ANTI-SIPHON	-	-	3/4"	-	EQUIPMENT: ZURN Z1333-C-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB	MOUNT 18" AFF
HB2	HOSE BIBB, EXTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, FREEZELESS, ANTI-SIPHON	-	-	3/4"	-	EQUIPMENT: ZURN Z1310-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB	MOUNT 18" AFF
HB3	HOSE BIBB, (MECHANICAL ROOMS / LIFT BAYS) INTERIOR, EXPOSED, AUTOMATIC DRAINING, VACUUM BREAKER	-	-	3/4"	-	EQUIPMENT: WOODFORD 24, PROVIDE WITH LOOSE TEE KEY FOR EACH HOSE BIBB	MOUNT 24" AFF
WCO	WALL CLEANOUT, CAST IRON BODY, STAINLESS STEEL WALL PLATE	**	-	-	-	CLEANOUT: ZURN Z-1446-BP, BRONZE PLUG, CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT
FCO	FLOOR CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE	**	-	-	-	CLEANOUT: ZURN ZN-1400, BRONZE PLUG CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED FLOOR
YCO	YARD CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE, INSTALLED IN 18"x18"x6" CONCRETE PAD	**	-	-	-	CLEANOUT: ZURN ZN-1474, INSTALL IN 18"x 18"x 6" DEEP CONCRETE PAD	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED GRADE
FD1	FLOOR DRAIN, CAST IRON BODY, SQUARE NICKEL BRONZE GRATE, ADJUSTABLE	**	-	-	-	DRAIN: ZURN ZN-415-S, 6" SQUARE GRATE P-TRAP: DEEP SEAL (MATCH DRAIN SIZE)	INSTALL TOP FLUSH WITH FINISHED FLOOR. SEE NOTE 1 BELOW.
FD2	FLOOR DRAIN, MECHANICAL ROOM CAST IRON BODY, ROUND GRATE, ADJUSTABLE, WITH SEDIMENT BUCKET	**	-	-	-	DRAIN: ZURN Z-556-Y, 8" DIAMETER, SLOTTED, CAST IRON P-TRAP: DEEP SEAL (MATCH DRAIN SIZE)	INSTALL TOP OF DRAIN LIP FLUSH WITH FLOOR. SEE NOTE 1 BELOW.
DSB1	DOWNSPOUT BOOT, DURA-COATED CAST IRON BODY	**	-	-	-	DRAIN: ZURN Z191	-
TD1	TRENCH DRAIN HIGH DENSITY POLYETHYLENE (HDPE), SS HEEL-PROOF GRATE	**	-	-	-	DRAIN SYSTEM: ZURN Z886-HD-HDPE GRATE: DUCTILE IRON SLOTTED, HEEL-PROOF, ADA (CLASS E) P-TRAP: DEEP SEAL, SEE DWGS FOR SIZE	PROVIDE P-TRAP AT EACH DRAIN CONNECTION TO TRENCH DRAIN. SEE NOTE 1 BELOW.

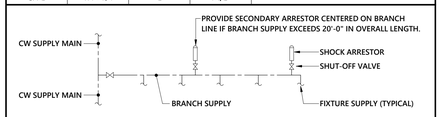
NOTES:
1. PROVIDE WATERLESS INLINE TRAP GUARD FOR EACH FLOOR DRAIN CONFORMING TO ASSE 1072 AND EQUAL TO RECOTORSEAL"SURE-SEAL" MODEL SS3009V. INSTALL TRAP GUARDS IN THE OUTLET OF THE FLOOR DRAIN BODY (NOT IN THE STRAINER).

** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	INLINE FLOOR DRAIN TRAP SEALER DRAINS, CLEANOUTS SHOCK ARRESTOR, TRAP PRIMERS WALL HYDRANTS, HOSE BIBBS	SURESEAL, MIFAB, PROVENT ZURN, J.R. SMITH, WADE, JOSAM, WATTS SIOUX CHIEF, PPP INC., ZURN, WATTS ZURN, WOODFORD, ZURN, J.R. SMITH, MIFAB

SHOCK ARRESTOR TABLE

DRAWING SYMBOL	FIXTURE UNITS	P.D.I. WH201 DESIGNATION	ARRESTOR SIZE	REMARKS
SA-A	1 - 11	A	1/2"	INSTALL SHOCK ARRESTORS PER THE PLUMBING DRAINAGE INSTITUTE (P.D.I.) GUIDELINES. ACCEPTED MANUFACTURERS: SIOUX CHIEF, WATTS, PPP INC., ZURN
SA-B	12 - 32	B	3/4"	
SA-C	33 - 60	C	1"	
SA-D	61 - 113	D	1-1/4"	
SA-E	114 - 154	E	1-1/2"	



OIL WATER SEPARATOR - OWS1

500 GALLON OIL INTERCEPTOR EQUAL TO STRIEM OT-500-SS OR APPROVED EQUAL BY ZURN OR XERXES. 562 GALLON LIQUID CAPACITY, POLYETHYLENE CONSTRUCTION WITH 7/8" NOMINAL WALL THICKNESS, 4" INLETS AND OUTLETS AND 3" VENTS. SEPARATOR SHALL BE MANUFACTURED FOR BELOW-GRADE INSTALLATION. SEPARATOR FLOW RATE SHALL BE 314 GPM. PROVIDE MANWAY TO MEET INVERT DEPTH AND H-20 TRAFFIC RATED MANHOLE COVERS AND FRAMES INSTALLED FLUSH WITH FINISHED GRADE. PROVIDE REINFORCED CONCRETE RELIEVING SLAB WHEN INTERCEPTOR IS LOCATED IN AREAS WITH VEHICLE ACCESS. INSTALL PER THE MANUFACTURERS INSTRUCTIONS. COORDINATE LOCATION WITH SITE UTILITY CONTRACTOR. PROVIDE SEPARATOR WITH OIL LEVEL MONITORING SYSTEM. SEE SCHEMATIC 8/P501.

PLUMBING EQUIPMENT SCHEDULE

SYM.	DESCRIPTION	CONN. SIZE INLET	OUT	SPECIFICATION	REMARKS
WH1	COMMERCIAL WATER HEATER, ELECTRIC FIRED, TANK TYPE, 30 GALLON CAPACITY 20.5" DIAMETER	1"	1"	EQUIPMENT: A.O. SMITH DEN-30 ELEC: 4.5 KW, 208 V, 1 PHASE RECOVERY: 23 GPH AT 80° RISE.	SET OUTLET TEMP TO 120°F. SEE SCHEMATIC 2/P501. SEE NOTE 1 BELOW.
ET1	THERMAL EXPANSION TANK 2 GALLON CAPACITY	3/4"	-	EQUIPMENT: AMTROL ST-12-C	SUPPORT TANK FROM STRUCTURE IF NOT MOUNTED ON FLOOR
RCP1	CIRCULATION PUMP, 3-SPEED, ALL BRONZE CONSTRUCTION	3/4"	3/4"	PUMP: B&G NBF-25, 125 WATTS, 120V, RATED FOR 6 GPM AT 8 FEET HEAD	SEE NOTE 2

NOTES:
1. COMMERCIAL ELECTRIC FIRED WATER HEATER SHALL HAVE AT LEAST A 96% THERMAL EFFICIENCY RATING, A 5 YEAR WARRANTY, ASME 150 PSI WORKING PRESSURE, INLET AND OUTLET TEMPERATURE GAUGE, TEMP GAUGE, 150 PSI T&P RELIEF VALVE, OPERATING LIMIT AND HIGH LIMIT CONTROLS. WATER HEATER SHALL EXCEED ASHRAE 90.1 REQUIREMENTS. WATER HEATER SHALL BE MONITORED BY BUILDING BAS SYSTEM. COORDINATE WITH CONTROLS CONTRACTOR.
2. INTERLOCK WITH FULLY ADJUSTABLE AQUASTAT AND 7-DAY, 24 HOUR TIMER.

** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	WATER HEATERS EXPANSION TANKS HW RECIRC PUMPS MIXING VALVES ELEV. SUMP PUMPS	LOCHINVAR, A.O. SMITH, BRADFORD WHITE AMTROL, B&G, A.O. SMITH, WATTS, WESSELS B&G, TACO, GRUNDFOS LEONARD, LAWLER, SYMMONS OIL MINDER, WEIL, LIBERTY

PLUMBING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	CONNECTION SIZE W	V	CW	HW	SPECIFICATION	REMARKS
P1	TOILET ELONGATED, WHITE VITREOUS CHINA, FLOOR MOUNTED (1.28 GPF) BATTERY POWERED SENSOR OPERATED FLUSH VALVE	4"	2"	1-1/4"	-	FIXTURE: KOHLER K-96053-0 "WELLCOMME ULTRA" FLUSH VALVE: SLOAN 8111-1.28-DFB SEAT: CHURCH 9500SSCT (WHITE)	SEE NOTE 1 BELOW
P1A	TOILET, A.D.A. COMPLIANT ELONGATED, WHITE VITREOUS CHINA, FLOOR MOUNTED (1.28 GPF) BATTERY POWERED SENSOR OPERATED FLUSH VALVE	4"	2"	1-1/4"	-	FIXTURE: KOHLER K-96057-0 "HIGHCLIFF ULTRA" FLUSH VALVE: SLOAN 8111-1.28-DFB SEAT: CHURCH 9500SSCT (WHITE)	INSTALL FLUSH LEVER ON OPEN ACCESS SIDE OF TOILET. SEE NOTE 1 BELOW
P2A	URINAL, A.D.A. COMPLIANT WHITE VITREOUS CHINA, CARRIER MOUNTED, (0.5 GPF) BATTERY POWERED SENSOR OPERATED FLUSH VALVE	2"	2"	3/4"	-	FIXTURE: KOHLER K-4991-ET-0 "BARDON" FLUSH VALVE: SLOAN 8186-0.5	FIXTURE LIP HEIGHT 17"AFF. SEE NOTE 2 BELOW
P3	LAVATORY, A.D.A. COMPLIANT WASH BASIN, 3-USER UNIT, NATURAL QUARTZ SURFACE, GRID DRAIN, THERMOSTATIC MIXING VALVE, 0.5 GPM AC POWERED SENSOR FAUCET, CHROME P-TRAP	2"	1-1/2"	1/2"	1/2"	FIXTURE: BRADLEY CORP LVRD3 FAUCET: BRADLEY CORP S53-3100, POLISHED CHROME, 0.5 GPM P-TRAP: MCGUIRE 8902 (1-1/4"x1-1/2", 17 GA.) SUPPLIES/STOPS: MCGUIRE LF175-LK COLOR: TO BE SELECTED BY ARCHITECT	PROVIDE UNIT WITH THERMOSTATIC MIXING VALVE. SET OUTLET TEMPERATURE TO 105 F. SEE NOTE 5 BELOW. SOAP DISPENSER BY OWNER.
P4	WATER COOLER & BOTTLE FILLER, A.D.A. COMPLIANT, STAINLESS STEEL FINISH, BI-LEVEL DOUBLE BOWL, CARRIER MOUNTED, INTEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH AUTO SHUT-OFF.	2"	1-1/2"	1/2"	-	FIXTURE: ELKAY LZSTLBWSLK, ELEC: 370 WATT, 120 VOLT, SINGLE PHASE P-TRAP: MCGUIRE 8902 (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: MCGUIRE LF175	PROVIDE CANE APRON WHEN WATER COOLER IS LOCATED ON AN EXPOSED WALL. SEE NOTE 4 BELOW
P6	MOP SINK, 32"x32"x12" TERRAZZO BASIN, STAINLESS STEEL THRESHOLD, STAINLESS STEEL WALL GUARDS, SERVICE FAUCET, HOSE, MOP HANGER BRACKET.	3"	1-1/2"	3/4"	3/4"	FIXTURE: FIAT TSBC-1611 FAUCET: FIAT 830AA DRAIN: FIAT 1453-BB ACCESSORIES: FIAT MSG3232 SS WALL GUARDS ACCESSORIES: FIAT 832-AA HOSE & BRACKET ACCESSORIES: FIAT 889-CC MOP HANGER P-TRAP: 3" DEEP SEAL	PROVIDE CHECK VALVES ON HW AND CW SUPPLIES. PROVIDE P&EW EYEWASH ADJACENT TO MOP SINK.

NOTES:
1. PROVIDE HEAVY DUTY CAST IRON CLOSET FLANGE WITH COMPRESSION SEAL AND TEST CAP EQUAL TO ZURN CF2980-CI4. OFFSET FLANGES ARE NOT ACCEPTABLE.
2. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED PLATE STYLE CARRIER EQUAL TO ZURN Z1222-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENSATE FOR THE BLOCK WALL THICKNESS.
3. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED, ADJUSTABLE CONCEALED ARM CARRIER EQUAL TO ZURN Z1231-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND BLOCK WALL, PROVIDE EXTENDED CONCEALED ARM SLEEVES TO COMPENSATE FOR THE BLOCK WALL THICKNESS.
4. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED PLATE STYLE CARRIER EQUAL TO ZURN Z1225-EZ-BL (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENSATE FOR THE BLOCK WALL THICKNESS.
5. PROVIDE PRE-MANUFACTURED A.D.A. COMPLIANT INSULATION KIT FOR EXPOSED P'TRAP AND SUPPLY TRIM UNDER SINK. INSULATION KIT SHALL MEET OR EXCEED ASTM E84.

** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	VITREOUS CHINA TOILET SEATS FLUSH VALVES MANUAL FAUCETS WASH BASINS ELEC. WATER COOLERS / DRINKING FOUNTAINS UTILITY SINKS SUPPLIES / STOPS, P-TRAPS ADA KIT FOR EXPOSED TRIM CARRIERS	KOHLER, AMERICAN STANDARD, ZURN, SLOAN, TOTO CHURCH, OLSONITE, BEMIS, CENTOCO SLOAN, ZURN, DELANEY T&S BRASS, CHICAGO, ZURN, DELTA COMMERCIAL, MOEN COMMERCIAL BRADLEY CORP, SLOAN, WILLOUGHBY ELKAY, OASIS, HAWS, HALSEY-TAYLOR FIAT, FLORESTONE, STERN WILLIAMS MCGUIRE, BRASSCRAFT, KEENEY, ZURN TRUEBRO, PLUMBEREX, KEENEY ZURN, J.R. SMITH, WADE, JOSAM, WATTS

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BID DOCUMENTS

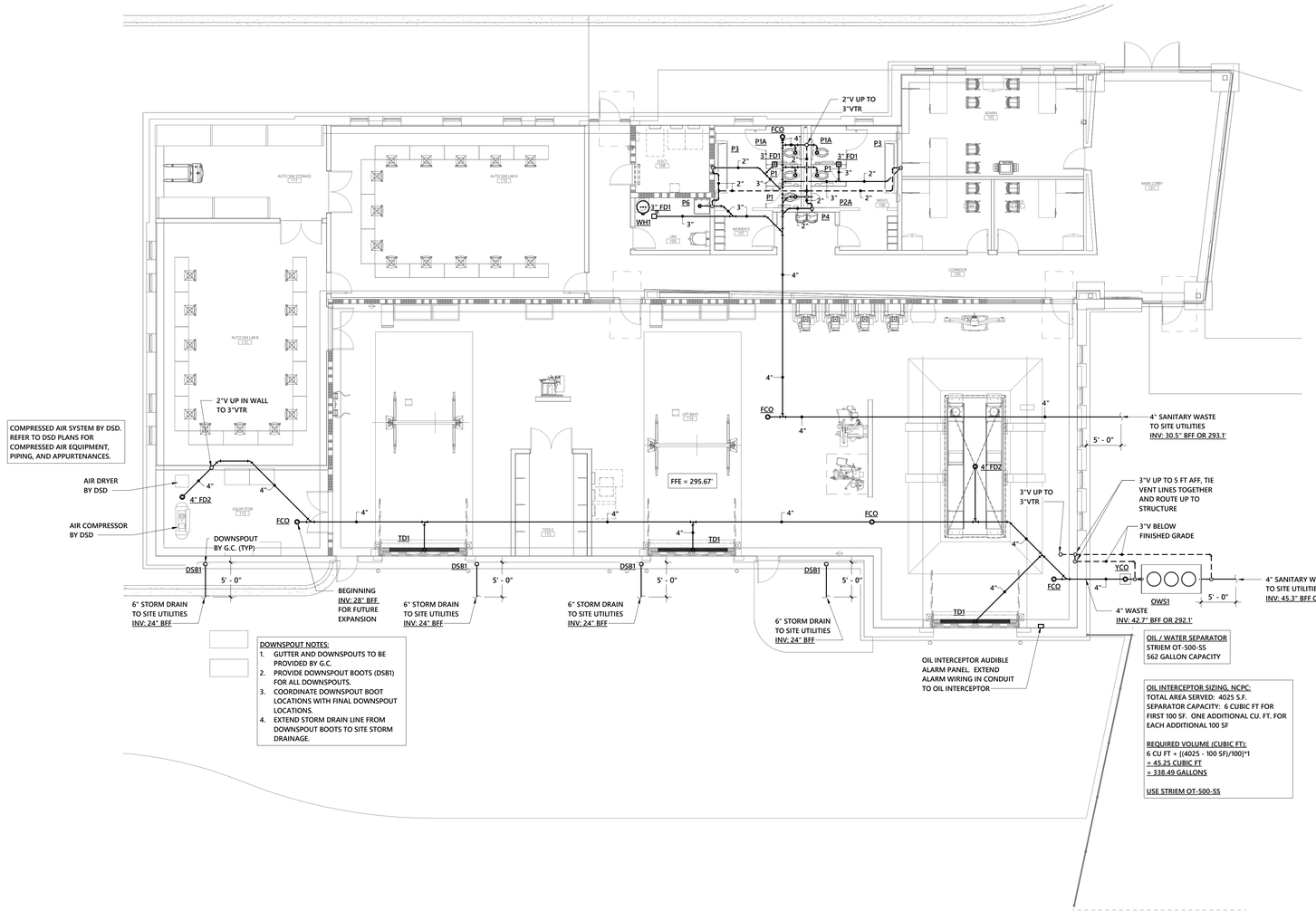
PLUMBING SCHEDULES

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
P002

Opt # 23-0128



1 **DRAINAGE PIPING FLOOR PLAN**
1/8" = 1'-0"

LIFE SAFETY PLAN LEGEND:

2 HOUR RATED WALL. UL U905 / U419

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

N TRUE NORTH

N PLAN NORTH

Opt # 23-0128

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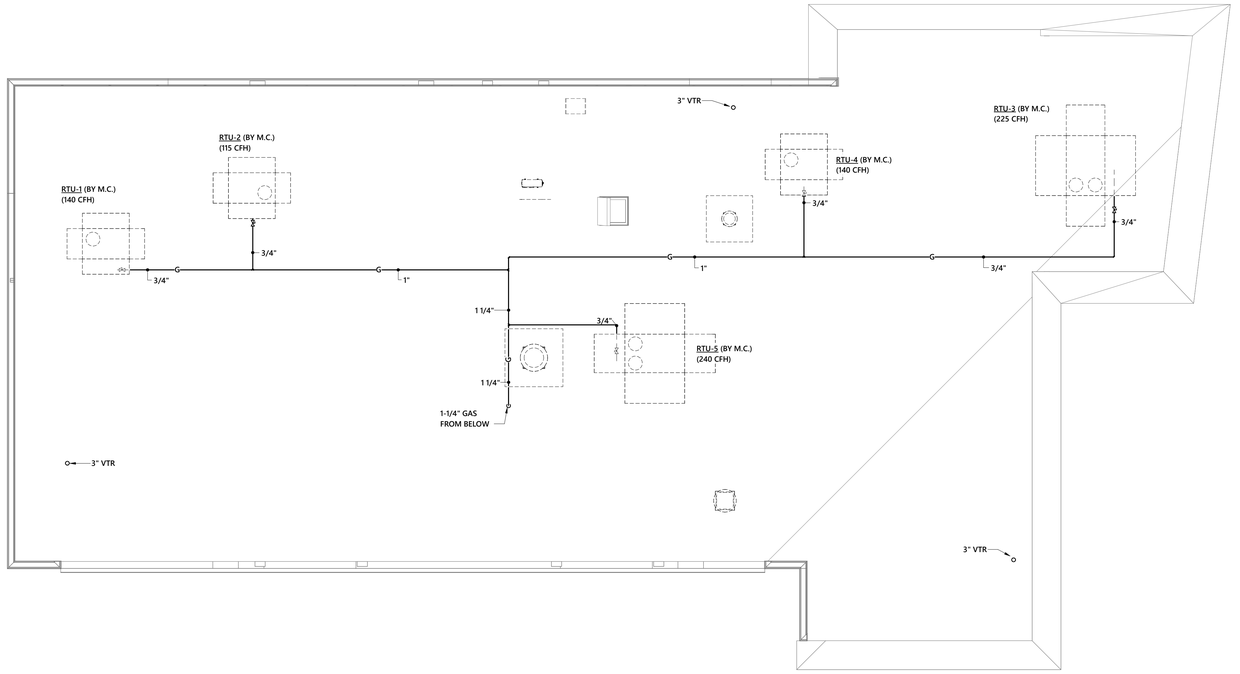
DRAINAGE PIPING FLOOR PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
P101



1 **PLUMBING ROOF PLAN**
1/8" = 1'-0"

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

N TRUE NORTH

N PLAN NORTH

Opt # 23-0128

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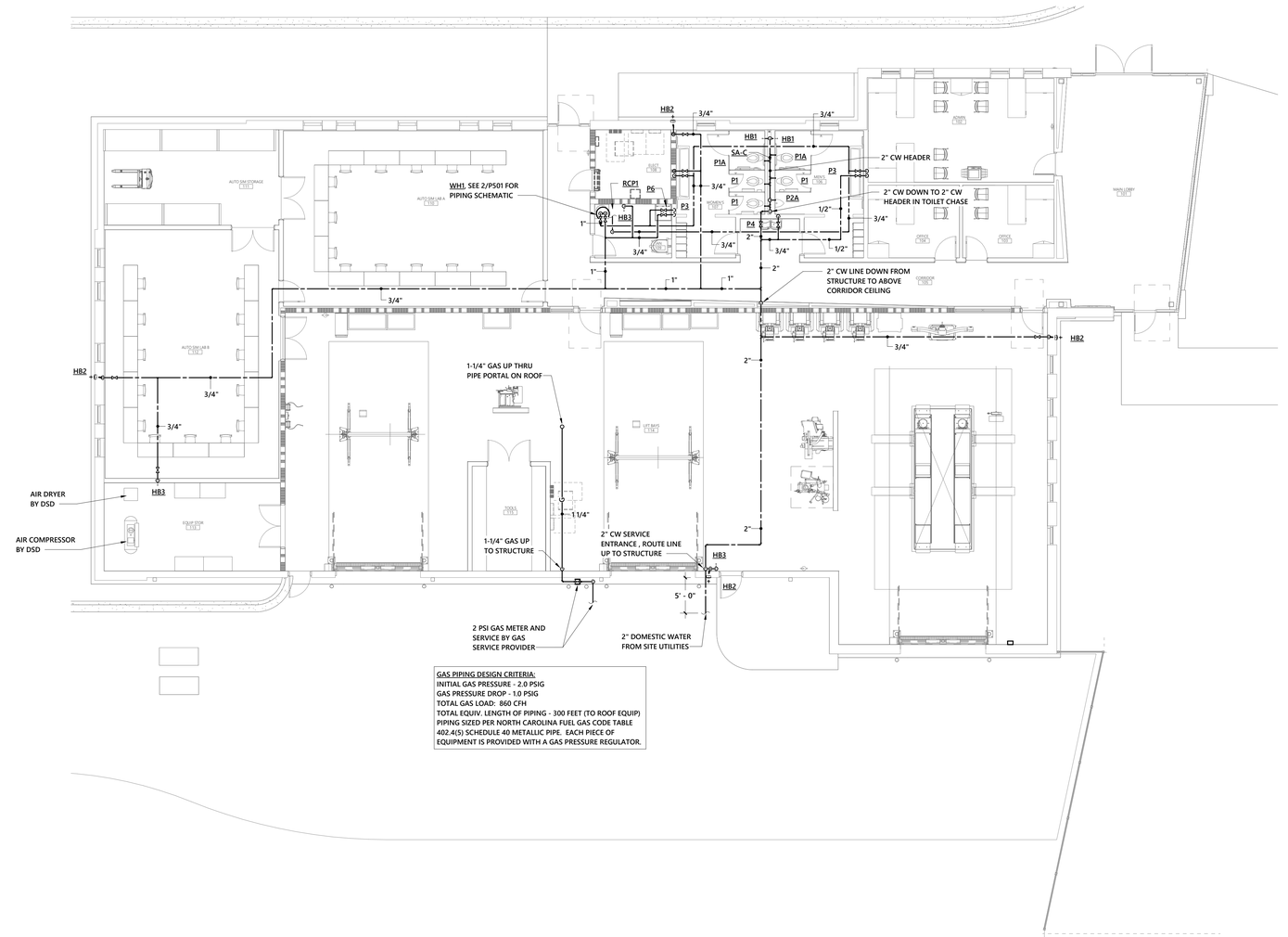
PLUMBING ROOF PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER

P102



GAS PIPING DESIGN CRITERIA:
INITIAL GAS PRESSURE - 2.0 PSIG
GAS PRESSURE DROP - 1.0 PSIG
TOTAL GAS LOAD: 860 CFH
TOTAL EQUIV. LENGTH OF PIPING - 300 FEET (TO ROOF EQUIP)
PIPING SIZED PER NORTH CAROLINA FUEL GAS CODE TABLE 402.4(5) SCHEDULE 40 METALLIC PIPE. EACH PIECE OF EQUIPMENT IS PROVIDED WITH A GAS PRESSURE REGULATOR.

1 SUPPLY PIPING FLOOR PLAN
1/8" = 1'-0"

LIFE SAFETY PLAN LEGEND:

2 HOUR RATED WALL. UL U905 / U419

N TRUE NORTH

N PLAN NORTH

0 5 10 20
SCALE: 1/8" = 1'-0"

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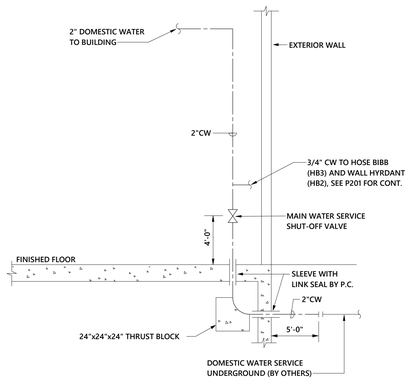
SUPPLY PIPING FLOOR PLAN

DATE: 3-3-2025
PROJECT NO: 23014

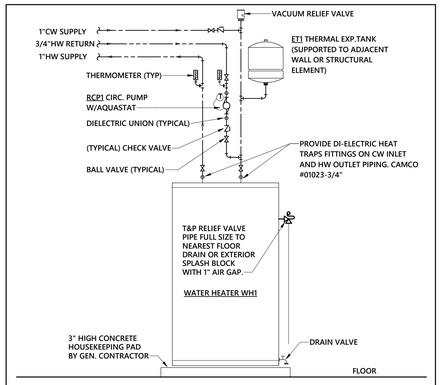
REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER

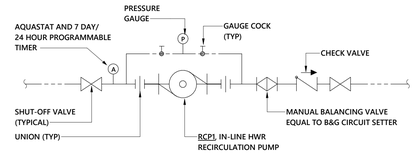
P201



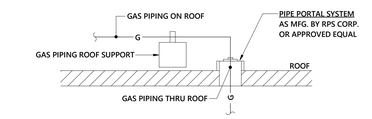
1 WATER SERVICE ENTRANCEW W/ WATER METER
NOT TO SCALE



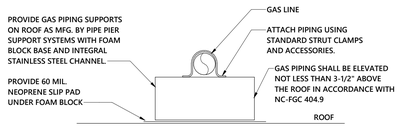
2 ELECTRIC WATER HEATER SCHEMATIC
NOT TO SCALE



3 HOTWATER RECIRC PUMP DETAIL
NOT TO SCALE



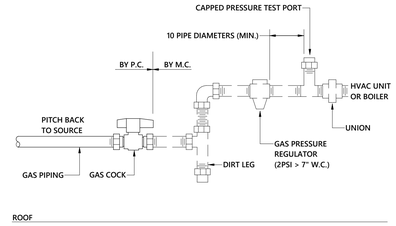
TYPICAL GAS PIPING THRU ROOF DETAIL



NOTES:
1. PROVIDE GAS SUPPORTS ON ROOF AT 8'-0" ON CENTER. PROVIDE ADDITIONAL SUPPORTS AT EQUIPMENT TO PREVENT WEIGHT OF PIPE BEING PLACED ON EQUIPMENT.
2. INSTALL GAS PIPING SUPPORTS AS MANUFACTURED BY PIPE PIER (OR APPROVED EQUAL) ACCORDING TO MANUFACTURER'S INSTRUCTIONS.

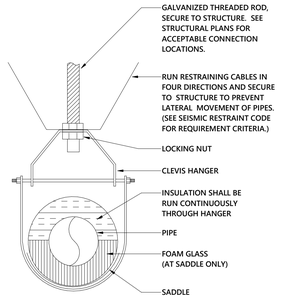
TYPICAL GAS PIPING SUPPORT DETAIL

4 TYPICAL GAS PIPING ROOF DETAILS
NOT TO SCALE

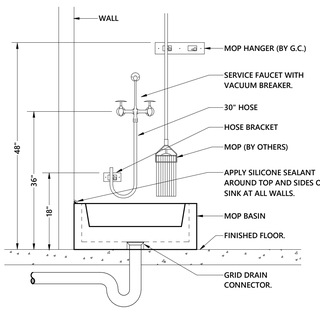


NOTES:
1. PROVIDE DIELECTRIC UNIONS WHERE DISSIMILAR METALS ARE JOINED.
2. GAS PIPING AND SHUT-OFF VALVE SHALL BE BY PLUMBING CONTRACTOR. DIRT LEG, REGULATOR, AND FINAL CONNECTION TO UNIT SHALL BE BY MECHANICAL (HVAC) CONTRACTOR.

5 GAS CONNECTION DETAIL (TO HVAC EQUIPMENT)
NOT TO SCALE

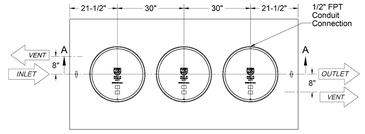


6 PIPE HANGER SCHEMATIC
NOT TO SCALE

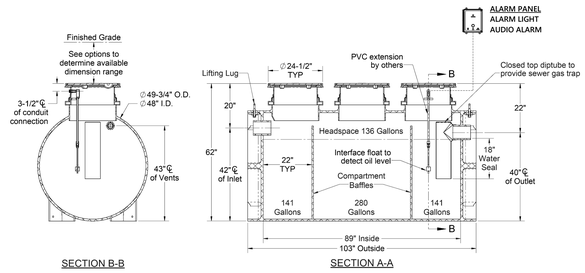


7 MOP BASIN AND ACCESSORIES
NOT TO SCALE

OIL INTERCEPTOR NOTES:
1. FOR GRAVITY DRAINAGE APPLICATIONS ONLY.
2. UNIT SHALL BE CONSTRUCTED OF POLYETHYLENE WITH 7/8" NOMINAL WALL THICKNESS.
3. UNIT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. INLET AND OUTLET SHALL BE 4".
5. EXTENSION COLLAR TO BE ORDERED TO MEET FINISH GRADE, CUT ON SITE FOR FINAL ADJUSTMENT AND CAULKED WITH SIKAFLEX BY CONTRACTOR FOR WATERTIGHT SEAL.
6. PROVIDE H-20 TRAFFIC RATED COVER AND RELIEVING SLAB.
7. SEPARATOR SHALL BE CERTIFIED TO IAPMO IGC 183-2016 AND CARRY A UPC LISTING.
8. INTERCEPTOR SHALL HAVE A LIFETIME WARRANTY AGAINST LEAKS AND STRUCTURAL FAILURE.
9. PROVIDE INTERCEPTOR WITH OIL MONITORING SYSTEM. OIL MONITORING SYSTEM SHALL INCLUDE BUT IS NOT LIMITED TO AUDIBLE ALARM PANEL, INTERFACE FLOAT, JUNCTION BOX, CABLE ROUTED IN WATERTIGHT CONDIUT (CONDUIT BY CONTRACTOR), AND OTHER APPURTENANCES.



TOP VIEW



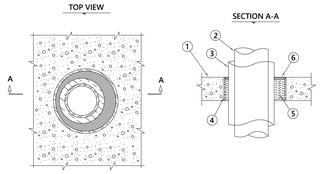
SECTION B-B

SECTION A-A

8 OIL SEPARATOR
NO SCALE

U.L. SYSTEM NO. CAJ5090
INSULATED METALLIC PIPE THROUGH CONCRETE WALL OR FLOOR

F RATING = 3-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = 4 CFM/SQ. FT.
L RATING AT 400°F = LESS THAN 1 CFM/SQ. FT.



1. CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK)
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 4" DIAMETER STEEL PIPE.
   B. MAXIMUM 4" DIAMETER COPPER PIPE.
   C. MAXIMUM 4" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER EMT.
3. MAXIMUM 3/4" THICK AB/PVC PIPE INSULATION.
4. OPTIONAL: MAXIMUM 8" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).
5. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
6. MINIMUM 1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 8-5/8".
2. ANNULAR SPACE = MINIMUM 1/2", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.CAJ5090

STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

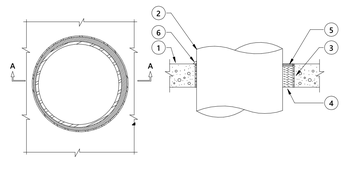
STEP 2 - BACKING MATERIAL: Pack mineral wool tightly around the penetrating item to the depth shown in the drawings, and recess it below the top surface of the floor (or both surfaces of a wall) to allow proper space for the firestop material.

STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to the depth shown. Wall penetrations require Firestop Sealant on both sides. Leave completed seal undisturbed for 48 hours.

9 U.L. SYSTEM NO CAJ5090 DETAIL
NOT TO SCALE

U.L. SYSTEM NO. CAJ1155
METAL PIPE THROUGH A SLEEVE IN CONCRETE WALL OR FLOOR

F RATING = 3-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



TOP VIEW SECTION A-A

1. FLOOR OR WALL ASSEMBLY: B. U.L. CLASSIFIED CONCRETE BLOCK WALL (MINIMUM 8" BLOCK). A. MINIMUM 4-1/2" THICK LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR.
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE.
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER EMT.
3. OPTIONAL: MAXIMUM 22" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).
4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) RECESSED 1/2" FROM TOP OF SLEEVE.
5. MINIMUM 1/2" DEPTH HILTI FS-ONE FIRESTOP SEALANT.
6. A GENEROUS BEAD OF HILTI FS-ONE FIRESTOP SEALANT AROUND OUTER PERIMETER OF STEEL SLEEVE.

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 22".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.CAJ1155

STEP 1 - PREPARATION: to application of firestopping materials. All surfaces must be clean, sound, dry and frost free prior

STEP 2 - BACKING MATERIAL: Firmly pack mineral wool around the penetrating item recessing it 1/2" below surface of the sleeve (or both ends of sleeve in wall)

STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to a min. depth of 1/2" flush with the end(s) of the sleeve. Wall penetrations require Firestop Sealant installed on both sides. Leave completed seal undisturbed for 48 hours.

10 U.L. SYSTEM NO CAJ-1155 DETAIL
NOT TO SCALE

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architecture planning interiors
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NORTH CAROLINA PROFESSIONAL SEAL 26023 ENGINEER GEORGE C. FOWLER III

3/3/25

RICHMOND COMMUNITY COLLEGE HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 Hamlet Ave, Hamlet, NC 28345

BID DOCUMENTS

PLUMBING DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
P501

Opt # 23-0128

TESTING, ADJUSTING, AND BALANCING

1. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.

2. CONDUCT TEST AND BALANCING IN ACCORDANCE WITH TECHNICAL PORTIONS OF THE AABC "NATIONAL STANDARDS FOR TESTING AND BALANCING HVAC SYSTEMS", LATEST EDITION.

3. INSTRUMENTS USED FOR BALANCING MUST HAVE BEEN CALIBRATED WITHIN A PERIOD OF SIX (6) MONTHS PRIOR TO BALANCING. SUBMIT SERIAL NUMBERS, AND DATES OF CALIBRATION OF ALL INSTRUMENTS TO BE USED PRIOR TO THE START OF WORK.

4. SET HVAC SYSTEM AIRFLOW AND WATER FLOW RATES WITHIN THE FOLLOWING TOLERANCES:

   A. SUPPLY, RETURN, AND EXHAUST FANS AND EQUIPMENT WITH FANS: MINUS 5 TO PLUS 10 PERCENT.

   B. AIR OUTLETS AND INLETS: 0 TO MINUS 10 PERCENT.

5. REFER TO SPECIFICATION SECTION 230593 AND CONTRACT DRAWINGS IN THEIR ENTIRETY FOR ADDITIONAL REQUIREMENTS.

ELECTRICAL/MECHANICAL DEMARCATION

REFER TO DETAIL 9/M-502 FOR MECHANICAL CONTRACTOR'S RESPONSIBILITIES RELATED TO ELECTRICAL DISCONNECTS, STARTERS AND WIRING OF MECHANICAL EQUIPMENT. ALL DISCONNECTS, STARTERS AND WIRING (LOAD SIDE OF DISCONNECTS) SHALL BE FURNISHED AND INSTALLED BY M.C. UNLESS OTHERWISE NOTED IN DETAIL 9/M-502. COORDINATE ALL ELECTRICAL REQUIREMENTS WITH E.C. PRIOR TO ASSEMBLING SHOP DRAWING SUBMITTALS OR ORDERING EQUIPMENT.

RETURN AIR PLENUM NOTE

THIS PROJECT WILL UTILIZE THE ABOVE CEILING SPACE FOR A RETURN AIR PLENUM, ALL ABOVE CEILING UTILITIES PROVIDED UNDER THIS PROJECT SHALL BE PLENUM RATED AND HAVE A FLAME SPREAD INDEX NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

C401 METHOD OF COMPLIANCE

- ■ 2018 NCECC CHAPTER 4
- ☐ ASHRAE 90.1-2013 PRESCRIPTIVE
- ☐ ASHRAE 90.1-2013 PERFORMANCE
- ☐ N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)
- ☐ COMCHECK PROVIDED (2018 NCECC)
- ☐ COMCHECK PROVIDED (90.1-2013)
- ☐ ENERGY MODELING DATA PROVIDED

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- ☐ C406.2 EFFICIENT MECH EQUIPMENT
- ■ C406.3 REDUCED LTG DENSITY
- ☐ C406.4 ENHANCED LTG CONTROLS
- ☐ C406.5 ON-SITE RENEWABLE ENERGY
- ☐ C406.6 DEDICATED OA SYSTEM
- ☐ C406.7 SERVICE WATER HEATING

C301 CLIMATE ZONE

3A - RICHLAND COUNTY, NORTH CAROLINA

DESIGN CONDITIONS

EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)

winter dry bulb	21° F.
summer dry bulb	94° F.
summer wet bulb	77° F.

INTERIOR (2018 NCECC SECTION C302.1)

winter dry bulb	70° F.
summer dry bulb	75° F.

C403.2 HEATING & COOLING LOADS AND EQUIPMENT & SYSTEM SIZING

BUILDING HEATING LOAD	REFER TO SCHEDULES
BUILDING COOLING LOAD	REFER TO SCHEDULES
INSTALLED HEATING CAPACITY	REFER TO SCHEDULES
INSTALLED COOLING CAPACITY	REFER TO SCHEDULES

C403.2.3 & C406.2 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

SYSTEM DESCRIPTION - DX/GAS VAV SINGLE ZONE PACKAGED ROOFTOP UNITS

- ■ MINIMUM HVAC EQUIP EFFICIENCY COMPLIANCE - TABLE C403.2.3
- ☐ INCREASED HVAC EQUIP EFFICIENCY COMPLIANCE - 10% OVER TABLE C403.2.3

EQUIP TYPE	SIZE CATEGORY (BTUH)	SUBCATEGORY	C403.2.3 MINIMUM EFFICIENCY (a)	10% INCREASED EFF. (a)	DESIGN EFFIC.
TABLE C403.2.3(1) - UNITARY AIR CONDITIONERS AND CONDENSING UNITS					
AIR COND, AIR COOLED	< 65,000 (<= 5 TONS)	SPLIT SYSTEM & SINGLE PACKAGE	13.0 SEER	14.3 SEER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 65,000 & < 135,000	SPLIT SYSTEM & SINGLE PACKAGE	11.2 EER 12.8 IEER	12.3 EER 14.1 IEER	SEE SCHEDULE
AIR COND, AIR COOLED	>= 135,000 & < 240,000	SPLIT SYSTEM & SINGLE PACKAGE	11.0 EER 12.4 IEER	12.1 EER 13.6 IEER	SEE SCHEDULE

C403.2.4 THRU C403.2.11

■ HVAC SYSTEMS ARE FULLY COMPLIANT WITH THE REQUIREMENTS FOR HVAC SYSTEM CONTROL, VENTILATION, ENERGY RECOVERY, DUCT AND PLENUM INSULATION AND SEALING, PIPING INSULATION, AND SYSTEM COMPLETION.

C403.2.12 - AIR SYSTEM DESIGN AND CONTROL

☐ ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.

■ FANS ABOVE 5 HP MEET THE CFM LIMITATIONS SHOWN BELOW:

OPTION 1 - FAN SYSTEM MOTOR NAMEPLATE HP - TABLE C403.2.12.1(1)

ALLOWABLE NAMEPLATE MOTOR HP	CONSTANT VOLUME MINIMUM CFM	VARIABLE VOLUME MINIMUM CFM	DESIGN CFM
7.5	6,818 CFM	5,000 CFM	SEE SCHEDULE
10	9,091 CFM	6,667 CFM	SEE SCHEDULE
15	13,636 CFM	10,000 CFM	SEE SCHEDULE
20	18,182 CFM	13,333 CFM	SEE SCHEDULE
25	22,727 CFM	16,667 CFM	SEE SCHEDULE
30	27,272 CFM	20,000 CFM	SEE SCHEDULE
40	36,364 CFM	26,667 CFM	SEE SCHEDULE
50	45,455 CFM	33,333 CFM	SEE SCHEDULE

C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS).

■ ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.

☐ NOT APPLICABLE.

C408 - SYSTEM COMMISSIONING

■ PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.

☐ PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

MECHANICAL GENERAL NOTES

SEE SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. THESE GENERAL NOTES ARE INTENDED TO SUPPLEMENT THE SPECIFICATIONS. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
2. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, S.S., ALUMINUM, OR SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THIS INCLUDES ANY MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ALL DUCTWORK SHALL BE GALVANIZED SHEET METAL (OR FABRIC AS NOTED ON PLANS) CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 6.0. ROOFTOP UNIT RETURN DUCTWORK AND TRANSFER DUCTS SHALL BE LINED WITH 1" THICK FIBERGLASS DUCT LINER FOR ACOUSTICAL PURPOSES. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE.
4. ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE NORTH CAROLINA INTERNATIONAL MECHANICAL CODE. SEAL MEDIUM PRESSURE SUPPLY DUCTWORK FOR POSITIVE 3" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 4.
5. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
6. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
7. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST. TESTING AND BALANCING CONTRACTOR TO CONFIRM FILTERS ARE CLEAN, AND FREE OF DEBRIS PRIOR TO BEGINNING WORK. THE MECHANICAL CONTRACTOR SHALL REPLACE ANY DIRTY FILTERS, AS NEEDED. TEST AND BALANCE REPORT TO BE COMPLETED BY AN INDEPENDENT, CERTIFIED TEST AND BALANCE CONTRACTOR.
8. UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED) AND OPERATION MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDED IN THE CONTRACT DOCUMENTS. THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETPOINTS.
9. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTED BY THE OWNER AND THE NC STATE CONSTRUCTION OFFICE.
10. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
11. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE COPPER TYPE K PIPE AND FITTINGS. DRAINS FROM UNITS SHALL BE TRAPPED. CONDENSATE DRAINS SHALL BE INSULATED WITH 1" THICK ARMAFLEX INSULATION. MINIMUM DRAIN SIZE SHALL BE ¾". TERMINATE ROOFTOP UNIT DRAINS ON A CONCRETE SPLASHBLOCK.
12. ALL REFRIGERANT PIPE SHALL BE NITROGENIZED ACR COPPER TUBE SIZE, INSULATE, AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS. REFRIGERANT PIPING INSULATION EXPOSED OUTDOORS SHALL BE COVERED WITH AN OUTER ALUMINUM JACKET.
13. ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.
14. INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" (MAXIMUM) ABOVE FINISH FLOOR. COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION. ANY DEVICE ON A PERIMETER WALL SHALL BE MOUNTED ON A FOAM-FILLED ELECTRICAL BOX, WITH ALL GAPS BETWEEN BOX AND WALL SEALED TO PREVENT INFILTRATION.
15. CONTRACTOR SHALL VERIFY LOCATION OF ALL ROOF PENETRATIONS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION. NEW ROOF PENETRATIONS MADE THROUGH EXISTING ROOF SYSTEMS SHALL BE VERIFIED WITH THE OWNER'S EXISTING ROOF WARRANTY PRIOR TO INSTALLATION.
16. ALL ROOF CURBS SHALL EXTEND A MINIMUM OF 8" ABOVE ROOF INSULATION OR AS INDICATED ON THE DRAWINGS, WHICHEVER IS GREATER. IN ADDITION, ALL ROOF CURBS OR EQUIPMENT SUPPORT RAILS THAT SUPPORT EQUIPMENT, PIPING, CONDUIT, ETC. EXPOSED ON THE ROOF SHALL HAVE SUFFICIENT HEIGHT TO MAINTAIN A MINIMUM OF 18" CLEARANCE BELOW SUPPORTED EQUIPMENT FOR ROOF MAINTENANCE.
17. CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKE.
18. MINIMUM GAS PIPING SIZE SHALL BE 3/4".
19. GAS PIPING AND FITTINGS SHALL BE BLACK STEEL, SCHEDULE 40, IN ACCORDANCE WITH ASTM SPECIFICATION A 106, WITH 150 PSI BLACK MALLEABLE IRON FITTINGS IN ACCORDANCE WITH ASTM SPECIFICATION A 47, GRADE 32510, AND ASA SPECIFICATION B16.3, 125 LB.
20. GAS PIPING SHALL BE INSTALLED TO THE REQUIREMENTS OF THE STATE BUILDING CODE AND NFPA STANDARD NO. 54. ALL PIPING TO BE SUPPORTED BY CLEVIS HANGERS WITH GALVANIZED ROD A MAXIMUM OF 8' ON CENTER. PIPING SHALL BE SUPPORTED BY ROD HANGERS IN THE PIPE RUN 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE PER THE STATE BUILDING CODE AND ASCE 7.
21. GAS PIPING SHALL BE INSTALLED TO THE REQUIREMENTS OF THE STATE BUILDING CODE AND NFPA STANDARD NO. 54. ALL PIPING TO BE SUPPORTED BY CLEVIS HANGERS WITH GALVANIZED ROD A MAXIMUM OF 8' ON CENTER. PIPING SHALL BE SUPPORTED BY ROD HANGERS IN THE PIPE RUN 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE PER THE STATE BUILDING CODE AND ASCE 7.
22. GAS PIPING SHALL BE TESTED IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN NFPA NO 54. ANY OTHER TEST AS REQUIRED BY THE LOCAL GAS INSPECTION DEPARTMENT OR GAS COMPANY SHALL ALSO BE PERFORMED.
23. GAS PIPING SHALL BE INSTALLED TO THE REQUIREMENTS OF THE STATE BUILDING CODE AND NFPA STANDARD NO. 54. ALL PIPING TO BE SUPPORTED BY CLEVIS HANGERS WITH GALVANIZED ROD A MAXIMUM OF 8' ON CENTER. PIPING SHALL BE SUPPORTED BY ROD HANGERS IN THE PIPE RUN 12" OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE SUPPORTING STRUCTURE PER THE STATE BUILDING CODE AND ASCE 7.
24. GAS PIPING SHALL BE TESTED IN ACCORDANCE WITH THE PROCEDURES DESCRIBED IN NFPA NO 54. ANY OTHER TEST AS REQUIRED BY THE LOCAL GAS INSPECTION DEPARTMENT OR GAS COMPANY SHALL ALSO BE PERFORMED.
25. NATURAL GAS PIPING AND FITTINGS ABOVE GRADE: SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234). PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2½" AND LARGER.
26. SPACE GAS PIPING HANGER RODS 8'-0" ON CENTER MAXIMUM AND SPACE TRANSVERSE BRACING 20'-0" ON CENTER MAXIMUM. TRANSVERSE BRACING FOR ONE SECTION MAY ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED TO IT IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE. COORDINATE HANGER LOCATIONS WITH STRUCTURAL DRAWING DETAILS.
27. PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.
28. PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). PROVIDE PRE-PRINTED LABELS WITH BLACK LETTERING INDICATING THE GAS PRESSURE AND THE WORD "GAS" ON THE PIPE AT 5'-0" CENTERS FOR ALL GAS PIPING.
29. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
30. DUCTWORK AND PIPING PASSING THROUGH/ABOVE ELECTRICAL ROOMS SHALL BE CLOSELY COORDINATED WITH THE ELECTRICAL CONTRACTOR. DUCTWORK OR PIPING SHALL NOT BE LOCATED ABOVE ELECTRICAL PANELS.
31. DUCT MOUNTED SMOKE DETECTORS AND SPOT DETECTORS SHALL BE SUPPLIED, WIRED FOR INTERFACE INSTALLED IN THE DUCT BY THE MECHANICAL CONTRACTOR.
32. MECHANICAL CONTRACTOR SHALL PROVIDE PRE-PRINTED COLOR-CODED PIPE LABELS WITH 1-1/2" HIGH LETTERING INDICATING SERVICE AND FLOW DIRECTION. PLASTIC PIPE LABELS UTILIZED IN A RETURN AIR PLENUM SHALL BE LISTED/APPROVED FOR USE IN A RETURN AIR PLENUM. ALL PIPING TO MATCH EXISTING FACILITIES STANDARD (IF APPLICABLE). OTHERWISE, PIPE LABELS SHALL MATCH THE FOLLOWING:

    REFRIGERANT PIPING: YELLOW BACKGROUND, BLACK LETTERING

33. ALL MECHANICAL EQUIPMENT SHALL BE U.L. LISTED AND LABELED AS A COMPLETE PACKAGE, NOT INDIVIDUAL COMPONENTS OR PARTS. PROVIDE REQUIRED 3RD PARTY FIELD UL LISTING SERVICES AS REQUIRED TO COMPLY.

COORDINATION DRAWINGS

THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, AND GENERAL CONTRACTOR). THE MECHANICAL CONTRACTOR WILL HAVE THE LEAD RESPONSIBILITY FOR THE COORDINATION DRAWINGS. THE MECHANICAL CONTRACTOR SHALL PRODUCE THE ORIGINAL DRAWINGS AND FORWARD THE DRAWINGS TO EACH OF THE OTHER CONTRACTORS FOR THEM TO ADD THEIR SYSTEMS TO THIS SET OF COORDINATION DRAWINGS. THE CONTRACTORS WILL DEVELOP THE DRAWINGS IN THIS ORDER: MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, IT/DATA (INCLUDING CABLE TRAY) AND GENERAL. THIS SHALL ALSO BE THE ORDER OF PRECEDENCE FOR INSTALLATION OF SYSTEMS. ANY RELOCATION OF SYSTEM ROUTINGS WILL BE FOUND IN THE COORDINATION PHASE AND NOTICED BY EACH OF THE CONTRACTORS. THESE DRAWINGS, WHEN COMPLETED, SHALL BE SIGNED OFF BY ALL OF THE ABOVE LISTED PARTIES. DRAWINGS SHALL BE COMPLETED PRIOR TO FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING SYSTEMS, OR PURCHASE OF EQUIPMENT. THE FOLLOWING ITEMS REPRESENT THE MINIMUM REQUIREMENTS FOR SHOP DRAWINGS AND COORDINATION DRAWINGS:

1. ALL SHOP AND COORDINAGION DRAWINGS WILL BE 1/4" = 1'-0" SCALE
2. DRAWINGS WILL BE ORIGINAL DRAWINGS AND NOT OVERLAYS OF THE CONTRACT/DESIGN
3. COORDINATION DRAWINGS WILL BE DRAWN ON REPRODUCIBLE MATERIAL 48"x36".
4. COORDINATION DRAWINGS ARE NOT SHOP DRAWINGS AND ARE REQUIRED IN ADDITION TO SHOP DRAWINGS.
5. ONCE THE COMPLETE COORDINATION DRAWINGS HAVE BEEN COMPILED, THE MECHANICAL CONTRACTOR WILL DISTRIBUTE ONE SIGNED SET TO EACH OF THE FOLLOWING CONTRACTORS: ELECTRICAL, PLUMBING, FIRE PROTECTION, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.

OWNER TRAINING

ALL EQUIPMENT SHALL BE PROVIDED WITH OWNER TRAINING FROM FACTORY AUTHORIZED AND CERTIFIED TRAINING PERSONNEL. TRAINING SHALL BE PROVIDED WITHIN 5 DAYS OF OWNER ACCEPTACE OF OPERATIONAL EQUIPMENT. DURATION AND FORMAT OF TRAINING SHALL BE COORDINATED WITH OWNER, BUT SHALL BE A MINIMUM OF 8 HRS (2) 4 HR SESSIONS OF ONSITE TRAINING WITH THE REQUIRED OWNER PERSONNEL. MECHANICAL CONTRACTOR SHALL DOCUMENT TRAINING WITH DATE/TIME, DURATION, AND OWNER SIGNATURE.

EQUIVALENT MANUFACTURERS LISTING

LISTING OF MANUFACTURER'S NAME DOES NOT GUARANTEE APPROVAL. ALL EQUIPMENT MUST MEET OR EXCEED QUALITY AND CAPACITIES OF SPECIFIED EQUIPMENT. FINAL APPROVAL WILL BE BASED ON EQUIPMENT SUBMITTALS. ANY MANUFACTURER NOT LISTED BUT WISHING TO BID THIS PROJECT SHALL SUBMIT A WRITTEN REQUEST A MINIMUM OF 7 DAYS PRIOR TO BID DATE OR AS INDICATED IN THE SPECIFICATIONS, PRIOR APPROVAL IS REQUIRED FOR ALL MANUFACTURERS NOT LISTED.

(ALPHABETICAL ORDER)
PACKAGED ROOFTOP UNITS: CARRIER, TRANE, JCI, DAIKIN
FANS: COOK, GREENHECK, PENN, TWIN CITY
AIR DISTRIBUTION: CARNES, METAL*AIRE, NAILOR, PRICE, TITUS
FIRE DAMPERS: GREENHECK, NAILOR, RUSKIN
DDC CONTROLS: ALERTON, HONEYWELL, SEIMENS, TRANE, CARRIER

NOTE:
ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF TH MECHANICAL CONTRACTOR.

DRAWING LIST

MECHANICAL SHEET INDEX

MECHANICAL LEGEND

SYMBOL	DESCRIPTION	ABBR.
D	CONDENSATE DRAIN	D
T	THERMOSTAT / TEMP SENSOR (4'-0" AFF TO TOP)	
T CO2	THERMOSTAT W/ CO2 SENSING (4'-0" AFF TO TOP)	
H	HUMIDISTAT (4'-0" AFF TO TOP)	
S	SWITCH (4'-0" AFF TO TOP)	
P	BAROMETRIC PRESSURE SENSOR	
NO2	NITROGEN DIOXIDE SENSOR	
CO	CARBON MONOXIDE SENSOR	
	SUPPLY AIR DIFFUSER (4-WAY)	
	RETURN AIR GRILLE	
	RETURN AIR GRILLE WITH SOUND ATTENUATION (SEE DETAIL)	
	EXHAUST AIR GRILLE	
	DOUBLE LINE DUCTWORK	
	SINGLE LINE DUCTWORK	
FD	FIRE DAMPER OR CEILING RADIATION DAMPER W/ ACCESS DOOR (SEE DETAIL)	
20/14Ø	20"x14" FLAT OVAL DUCT	
20x14	20"x14" RECTANGULAR DUCT	
20x14L	20"x14" RECTANGULAR DUCT LINED	
8Ø	8" DIAMETER ROUND DUCT	
DD	DUCT MOUNTED SMOKE DETECTOR W/ ACCESS DOOR	
SP	STATIC-PRESSURE SENSOR	
BD	BACKDRAFT DAMPER	
C	CARBON MONOXIDE SENSOR	
CO2	CARBON DIOXIDE SENSOR	
U	UNDERCUT DOOR	
M.C.	MECHANICAL CONTRACTOR	
E.C.	ELECTRICAL CONTRACTOR	
P.C.	PLUMBING CONTRACTOR	
N.I.C.	NOT IN CONTRACT	
AFF	ABOVE FINISHED FLOOR	
AFG	ABOVE FINISHED GRADE	
DN	DOWN	
UP	UP	

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3/3/25

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1042 Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

MECHANICAL LEGEND AND NOTES

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS

NO:	DATE:	DESCRIPTION:

SHEET NUMBER

M001

Opt # 23-0128

ROOF TOP UNIT SCHEDULE (DX COOLING, GAS HEAT, R-410 REFRIGERANT)

SYMBOL	LOCATION	AREA SERVED	SUPPLY FAN		OUTSIDE AIRFLOW (CFM)	OPERATING WEIGHT (LBS)	COOLING CAPACITY		EFFICIENCY		HEATING CAPACITY			HOT GAS REHEAT COIL			ELECTRICAL DATA								MANUFACTURER & MODEL NO.
			AIR FLOW (CFM)	E.S.P. (IN. H_2O)			TOTAL CAPACITY	SENSIBLE CAPACITY	EER	SEER/IEER	INPUT MIN. (BTUH)	INPUT MAX. (BTUH)	HIGH OUTPUT (BTUH)	LAT (DB)	LAT (WB)	TOTAL CAPACITY	COMP QTY.	RLA/FLA	MCA	MOCP	SUPPLY FAN (H.P.)	RELIEF/EXH. FAN (H.P.)	VOLTS	PHASE	Hz	
RTU-1	ROOFTOP	AUTO SIM B / STORAGE	1640	0.5	300	839	47,300	34,528	12	SEER - 16.4	105,000	140,000	113,400	79.4°F	64.3°F	17,190	1	6.4/0.48	15.3	20	1.2	N/A BAR. RELIEF	460	3	60	DAIKIN DRG0484DH00065C
RTU-2	ROOFTOP	AUTO SIM LAB A	1400	0.5	275	735	37,135	30,078	12.1	SEER - 16.4	86,300	115,000	93,200	74.1°F	63.9°F	12,328	1	5.7/0.48	14.4	20	1.2	N/A BAR. RELIEF	460	3	60	DAIKIN DRG0364DH00124C
RTU-3	ROOFTOP	MAIN LOBBY	2920	0.5	300	1380	88,800	60,384	12.2	IEER - 16	168,750	225,000	182,250	68.8°F	62.2°F	47,938	2	12.2/1.7	25.1	30	2.4	N/A BAR. RELIEF	460	3	60	DAIKIN DRG0904DH00058C
RTU-4	ROOFTOP	OFFICES / ADMIN	1600	0.5	320	810	47,763	37,615	12	SEER - 16.4	105,000	140,000	113,400	78.6°F	63.8°F	17,234	1	6.4/0.48	15.3	20	1.2	N/A BAR. RELIEF	460	3	60	DAIKIN DRG0484DH00065C
RTU-5	ROOFTOP	LIFT BAYS / TOOLS	4750	0.5	1100	1492	137,766	101,993	11.5	IEER - 15.5	180,000	240,000	194,400	74.7°F	64.0°F	42,716	2	19.4/3.2	36.6	45	3.5	N/A BAR. RELIEF	460	3	60	DAIKIN DRG1504DH00045C

NOTES:

1. COOLING CAPACITIES BASED ON 95° AMBIENT, 80/67 ENTERING AIR. HEATING COIL CAPACITY IS BASED ON 65° F. E.A.T. & 95° F. L.A.T.
2. PROVIDE ALL UNITS WITH: ROOF CURB, DDC CONTROLS, FUSED DISCONNECT, METAL FILTER FRAMES WITH REPLACEABLE ROLL FILTER MEDIA (MERV 8 MINIMUM), ECONOMIZER, RETURN AIR BACKDRAFT DAMPER, INTERMITTENT PILOT IGNITION, CONDENSER COIL HAIL GUARDS AND HINGED ACCESS DOORS WITH "TOOL-LESS" ENTRY.
3. ALL UNITS SHALL BE AGA CERTIFIED, U.L. LABELED, AND ASHRAE 90.1 COMPLIANT.
4. PROVIDE EACH UNIT 2000CFM OR GREATER WITH A PHOTOELECTRIC TYPE SMOKE DETECTOR, INSTALLED IN THE RETURN DUCT AT THE UNIT CONNECTION WIRED TO SHUT DOWN THE UNIT UPON ACTIVATION. SPOT DETECTOR SHALL BE LOCATED IN ACCESSIBLE LOCATION, ACCESSED FROM INSIDE THE UNIT. SMOKE DETECTOR SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN DUCT BY THE MECHANICAL CONTRACTOR.
5. PRIMARY COOLING COIL DRAIN PAN SHALL BE PROVIDED WITH A FLOAT SWITCH BY UNIT MFR; ACTIVATION OF THE FLOAT SWITCH SHALL SHUT DOWN UNIT AND SEND AN ALARM TO THE CENTRAL BAS. UNIT CONDENSATE DRAIN PAN SHALL SLOPE IN TWO DIRECTIONS AND SHALL COMPLY WITH ASHRAE 62.1.
6. PROVIDE 5 YEAR COMPLETE WARRANTY; INCLUDING LABOR, MATERIAL AND REFRIGERANT.
7. ALL ELECTRICAL COMPONENTS SERVING AND WITHIN ROOFTOP UNITS MUST HAVE A MINIMUM SCCR RATING OF 35 KAIC.
8. ALL UNITS SHALL BE PROVIDED WITH HOT GAS REHEAT COIL AND CONTROLS FOR DEHUMIDIFICATION.
9. UNIT ARE LOW PRESSURE SINGLE ZONE VARIABLE VOLUME.
10. ALL UNITS SHOULD BE PROVIDED WITH BAROMETRIC RELIEF DAMPERS.

GRILLE AND DIFFUSER SCHEDULE

SYMBOL	SERVICE	CFM RANGE	FACE SIZE	NECK SIZE	TYPE	OBD	PRICE
A	SUPPLY	105-215	24x24	8"	SQUARE PLAQUE	YES	SPD
		220-350	24x24	10"	SQUARE PLAQUE	YES	SPD
B**	SUPPLY	0-200	10x4	--	SPIRAL SIDEWALL	YES	SDG
		205-425	16x6	--	SPIRAL SIDEWALL	YES	SDG
		430-575	22x6	--	SPIRAL SIDEWALL	YES	SDG
C*	RETURN	105-175	24x24	8"	PERFORATED	NO	PDDR
D	EXHAUST	0-100	12x12	6"	PERFORATED	NO	PDDR
E	EXHAUST	0-100	24x24	6"	PERFORATED	NO	PDDR
		105-175	24x24	8"	PERFORATED	NO	PDDR
		180-270	24x24	10"	PERFORATED	NO	PDDR
		275-390	24x24	12"	PERFORATED	NO	PDDR
		395-500	24x24	12x12	PERFORATED	NO	PDDR
F	SUPPLY	0-325	36"L; (4) 1" SLOTS		LINEAR SLOT	NO	SDA
G	RET/EXH	SEE PLANS FOR SIZE AND AIRFLOW			SINGLE DEFLECT.	NO	600
H	SUPPLY	0-600	14x10	14x10	DBLE DEFLECT.	NO	520
TF	THERMAFUSER - SUPPLY			NOTE 6			

NOTES:

1. ALL DEVICES SHALL BE FURNISHED WITH AN ENAMEL OFF-WHITE FINISH.
2. ALL DEVICES SHALL BE FURNISHED WITH FRAMES SUITABLE FOR TYPE OF INSTALLATION REQUIRED.
3. ALL AIR TERMINALS THAT SERVE TOILETS/JANITORIAL SPACES SHALL BE ALUMINUM
4. SUPPLY LINEAR SLOTS AND LINEAR BAR DIFFUSERS/GRILLES SHALL BE PROVIDED WITH INSULATED PLENUMS WITH ROUND NECK CONNECTION
5. GRILLES MARKED "TF" SHALL BE SQUARE THERMA-FUSERS (ACUTHERM MODEL TF-HC THERMALLY POWERED VARIABLE AIR VOLUME DIFFUSERS). BALANCE AIR QUANTITY TO DELIVER LISTED CFM AS A MAXIMUM WHEN GRILLE BLADES ARE WIDE OPEN IN EITHER HEATING OR COOLING MODE. PROVIDE WITH FACTORY RELIEF RING TO DIVERT UNUSED SUPPLY AIR INTO THE CEILING PLENUM. SEE PLANS FOR NECK SIZES.

* RETURN AIR GRILLE AIRFLOW BASED OFF SUPPLY AIRFLOW PROVIDED TO ROOM

** DUCT MOUNTED DIFFUSERS SHALL BE PROVIDED WITH FULL WIDTH AIR SCOOPS

FAN SCHEDULE

SYMBOL	LOCATION	TYPE	CFM	APPROX. S.P.	DRIVE	FAN RPM	ELECTRICAL DATA			MANUFACTURER	ACCESSORIES	CONTROLS
							AMPS	H.P.	VOLTAGE	GREENHECK		
F-1	ROOF	DOWNBLAST	525	0.5"	DIRECT	1620	1.5	1/10	115/1/60	G-090-VG	A,B,H	1
F-2	ROOF	DOWNBLAST	3025	0.5"	DIRECT	584	9.8	1/2	115/1/60	GB-220	A,B,H	4
F-3	ELECT 108	INLINE	500	0.25"	DIRECT	743	6.6	1/2	115/1/60	SQ-100-VG	A,B,C,D	2
F-4	EQUIP STOR 113	CABINET	80	0.25"	DIRECT	950	0.19	0	115/1/60	CSP-A110	A,B,C,D	1

ACCESSORIES

A: DISCONNECT SWITCH
B: BACKDRAFT DAMPER
C: ACOUSTICAL LINING
D: HANGING BRACKETS WITH VIBRATION ISOLATION
E: BELT GUARD
F: EXTENDED LUBE LINES
G:MAGNETIC STARTER WITH AUXILIARY CONTACTS
H: ROOF CURB
I: GREASE TRAP
J: COATED WHEEL

CONTROLS

1: CONTROLLED BY BUILDING AUTOMATION SYSTEM
2: ROOM THERMOSTAT; BAS STATUS
3: INTERLOCK WITH ASSOC. HOOD; BAS STATUS
4: WALL MOUNTED MANUAL SWITCH (2 HR TIMER) & CO/NO2 SENSOR; BAS STATUS

NOTES:

1. ALL FANS SHALL BE U.L. LISTED AND LABELED AND SHALL BE AMCA CERTIFIED FOR SOUND AND AIR FLOW. ALL FANS INSTALLED INSIDE, ABOVE, OR ADJACENT TO OCCUPIED SPACES SHALL HAVE A MAXIMUM 9.0 INLET SONE LEVEL.
2. ALL FANS SHALL BE SUPPLIED BY ONE MANUFACTURER UNLESS NOTED OTHERWISE.
3. MECHANICAL CONTRACTOR SHALL PROVIDE MAGNETIC STARTER WITH AUXILIARY CONTACTS AS REQUIRED.
4. INSTALL INLINE FANS TIGHT TO BOTTOM OF STRUCTURE

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): RTU-1

OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CLASSROOMS	7.5	0	35	0	857	30	225	0	0
STORAGE ROOMS	0	0.12	0	0	331	0	0	40	0
			BLDG TOTAL OUTSIDE AIR REQ'D (Ez=0.8, CFM)				265		
			BUILDING TOTAL OUTSIDE AIR PROVIDED (CFM)				300		
					BUILDING TOTAL EXHAUST AIR REQUIRED (CFM)				N/A
					BUILDING TOTAL EXHAUST AIR PROVIDED (CFM)				N/A

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): RTU-2

OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
CLASSROOMS	7.5	0	35	0	903	32	237	0	0
			BLDG TOTAL OUTSIDE AIR REQ'D (Ez=0.8, CFM)				237		
			BUILDING TOTAL OUTSIDE AIR PROVIDED (CFM)				275		
					BUILDING TOTAL EXHAUST AIR REQUIRED (CFM)				N/A
					BUILDING TOTAL EXHAUST AIR PROVIDED (CFM)				N/A

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): RTU-3

OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
MAIN ENTRY LOBBIES	5	0.06	10	0	564	6	28	34	0
			BLDG TOTAL OUTSIDE AIR REQ'D (Ez=0.8, CFM)				62		
			BUILDING TOTAL OUTSIDE AIR PROVIDED (CFM)				300		
					BUILDING TOTAL EXHAUST AIR REQUIRED (CFM)				N/A
					BUILDING TOTAL EXHAUST AIR PROVIDED (CFM)				N/A

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): RTU-4

OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/FIXT)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
OFFICE SPACES	5	0.06	5	0	646	3	16	39	0
TOILET ROOMS	0	0	0	70	393	6*	0	0	420
COORIDOR	0	0.06	0	0	598	0	0	36	0
			BLDG TOTAL OUTSIDE AIR REQ'D (Ez=0.8, CFM)				91		
			BUILDING TOTAL OUTSIDE AIR PROVIDED (CFM)				320		
					BUILDING TOTAL EXHAUST AIR REQUIRED (CFM)				420
*OCCUPANCY BASED ON SEAT COUNT					BUILDING TOTAL EXHAUST AIR PROVIDED (CFM)				450*
					* ADDITIONAL OA PROVIDED VIA ASSOCIATED RTU-3				

VENTILATION CALCULATIONS (NCMC 2018, SECT 403): RTU-5

OCCUPANCY CLASSIFICATION	PEOPLE O/A RATE IN BREATHING ZONE (CFM/PERSON)	AREA O/A RATE IN BREATHING ZONE (CFM/SQ. FT.)	DEFAULT OCCUPANCY DENSITY (PEOPLE/1000 SQ. FT.)	EXHAUST AIRFLOW RATE (CFM/SQ. FT.)	AREA (SQ. FT.)	CALCULATED OCCUPANCY (PEOPLE)	CALCULATED PEOPLE O/A (CFM)	CALCULATED AREA O/A (CFM)	CALCULATED AREA E/A (CFM)
STORAGE ROOMS	0	0.12	0	0	309	0	0	37	0
REPAIR GARAGES	0	0	0	0.75	4033	0	0	0	3025
			BLDG TOTAL OUTSIDE AIR REQ'D (Ez=0.8, CFM)				37		
			BUILDING TOTAL OUTSIDE AIR PROVIDED (CFM)				1100(RTU-5)/2000(OAH-1)		
					BUILDING TOTAL EXHAUST AIR REQUIRED (CFM)				3025
					BUILDING TOTAL EXHAUST AIR PROVIDED (CFM)				3025

DUCTLESS SPLIT SYSTEMS (COOLING ONLY)

INDOOR							OUTDOOR									
		ELECTRICAL DATA						COOLING CAPACITY		ELECTRICAL DATA						
SYMBOL	CFM	MCA	MOCP	VOLTAGE/PHASE	UNIT WEIGHT	MANUFACTURER DAIKIN	SYMBOL	TC (BTUH)	SHC (BTUH)	MCA	MOCP	VOLT	PH	WEIGHT	MANUFACTURER	MODEL NO.	REMARKS
IDU-1	425 CFM	0.0 A	0.0 A	208/1	21 lb	FTKF12AXVJU	ODU-1	12000 Btu/h	9540 Btu/h	9.2 A	15.0 A	208 V	1	60 lb	DAIKIN	RKF12AXVJU	R-32 REFRIGERANT

NOTES:

1. ALL UNITS SHALL BE U.L. LISTED AND HAVE A MINIMUM SEER OF 13
2. COOLING CAPACITIES ARE BASED ON 95 AMBIENT, 80 ENTERING AIR DRY BULB, 67 ENTERING AIR WET BULB. AIRFLOWS INDICATED ARE AT 'HIGH' SPEED.
3. MOUNT UNITS ON EQUIPMENT SUPPORT RAILS ON ROOF.
4. PROVIDE MANUFACTURER'S SUGGESTED CLEARANCES AROUND UNIT.
5. PROVIDE UNITS WITH MANUFACTURER'S LOW AMBIENT CONTROLS FOR OPERATION DOWN TO 0 F, CONDENSATE PUMP, INVERTER COMPRESSOR, 7-DAY PROGRAMMABLE THERMOSTAT (WALL-MOUNTED), NON-LOCKING DISCONNECT FOR INDOOR UNIT. HAIL GUARDS
6. PROVIDE OUTDOOR UNITS WITH 6 YEAR EXTENDED COMPRESSOR WARRANTY.
7. SEE MANUFACTURER'S RECOMMENDATIONS FOR REQUIRED ADDITIONAL REFRIGERANT CHARGE AND RECOMMENDED LINE-SET LENGTHS.
8. FOR ALL INDOOR UNITS THE POWER SUPPLY IS FED FROM THE ASSOCIATED OUTDOOR UNIT, THE OUTDOOR UNIT SHALL RECEIVE A DEDICATED ELECTRICAL CONNECTION AS NOTED IN THE SCHEDULE. THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER TO THE NOTED UNITS. THE MECHANICAL CONTRACTOR SHALL PROVIDE DISCONNECT SWITCHES, AND POWER WIRING BETWEEN DISCONNECT AND EQUIPMENT.
9. REFRIGERANT PIPING AND WIRING FOR WALL-MOUNTED INDOOR UNITS SHALL BE ROUTED IN WALL WHERE POSSIBLE.
10. MOUNT INDOOR AC UNIT 9'-0" A.F.F. COORDINATE WITH ALL UTILITIES, LIGHTS, CEILING, ETC.

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BID DOCUMENTS

MECHANICAL SCHEDULES & VENT CALCS.

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS

NO: DATE: DESCRIPTION:

SHEET NUMBER

M002

Opt # 23-0128

MINIMUM INPUT/OUTPUT SUMMARY

SYSTEM, APPARATUS, OR AREA POINT DESCRIPTION	INPUTS – ANALOG – MEASURED: TEMPERATURE	PRESSURE	RH	KW	AIR FLOW	WATER FLOW	CO2	HERTZ	STEAM FLOW (LBS)	NG FLOW (CFH)	AMPS	INPUTS – ANALOG – CALC.: KWH	ENTHALPY	RUN TIME	EFFICIENCY	INPUTS – BINARY: STATUS	FILTER	SMOKE	FREEZE	AIR FLOW	METER	OVER-RIDE	OUTPUTS – DIGITAL: OFF-ON	OFF-AUTO-ON	OFF-HI-LO	OPEN-CLOSE	OUTPUTS – ANALOG: DMPR. POS.	VALVE POS.	SETPOINT ADJ.	STEP CONTROL	SYSTEM FEATURES – ALARMS: HI ANALOG	LO ANALOG	HI BINARY	LO BINARY	PROOF	SYSTEM FEATURES – PROGRAMS: TIME SCHEDULING	DEMAND LIMITING	DUTY CYCLE	START/STOP OPT.	ENTHALPY OPT.	SMOKE CNT.	TREND	ALARM INSTRUCT	MAIN. WK. ORD.	GENERAL: COLOR GRAPHIC	SUPPLEMENTAL NOTES
RTU-1,2,3,4,5																																				X			X			X			X	
Supply & Return Fan																X									X				X													X				
Supply Static Pressure		X																																								X				
Disch. Temp/Hum	X																																									X				
Supply Temp/Hum	X																																									X				
Return Temp/Hum	X																																									X				
Return CO2							X																								X											X				
Return RH			X																																							X				
Mixed Air Temp/Hum	X																																									X				
OA Damper																											X															X				
Return Damper					X																						X															X				
Relief Damper					X																						X															X				
Smoke Detector																		X																								X				
Filter Status																	X																									X				
Over-ride																						X																				X				
Space Humidity			X																												X											X				
FANS																																										X			X	
Electrical Room Fans																							X																			X				
General Exhaust Fans																							X																			X				
Lift Bay Fans																																														Monitor Per Mfr. Req.
MISC POINTS																																										X				
OA Temp	X												X																		X											X				
Dew Point	X												X																													X				
Fire Alarm Status												X																														X				FACP by Division 26
OA CO2							X																																			X				
OA RH			X																																							X				
Building Pressure Sensors		X																																								X				

GENERAL NOTE:

INPUT/OUTPUT SUMMARY IS A GENERAL LIST OF CONTROL POINTS REQUIRED FOR THE OPERATION OF THE MECHANICAL SYSTEM. IN ADDITION TO CONTROL POINTS INDICATED, THE CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADDITIONAL POINTS AS REQUIRED FOR OPERATION OF THE MECHANICAL SYSTEM AS SPECIFIED AND OUTLINED IN THE SEQUENCE OF OPERATION AND TO COMPLY WITH THE SPECIFICATIONS.

SEQUENCE OF OPERATION

A COMPLETE AND OPERATIONAL DDC CONTROL SYSTEM (BAS) SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS (SECTION 230900) AND AS INTENDED ON THESE PLANS. ALL CONTROL POINTS AND EQUIPMENT SEQUENCES OF OPERATION LISTED IN SPECIFICATION SECTION 230900 SHALL BE CONSIDERED IN ADDITION TO THOSE LISTED HERE. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED BEFORE BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

GENERAL:

BUILDING AUTOMATION SYSTEM (BAS) SHALL PROVIDE PROGRAMMED/TIMED OPERATION OF THE BUILDING HVAC SYSTEM AND SYSTEM COMPONENTS BY PLACING THE SYSTEM IN "OCCUPIED" OR "UNOCCUPIED" MODES BASED ON THE OWNERS OPERATING SCHEDULE. UNOCCUPIED MODE WILL BE A MANUAL OPERATION THROUGH THE BAS, OR AS SCHEDULED BY THE OWNER. (COORDINATE WITH RCC FOR FINAL HOURS OF OPERATION), UNOCCUPIED WILL BE FOR THE REMAINING HOURS. MINIMUM ZONES FOR OCCUPANCY SETTINGS SHALL BE GROUPED AS FOLLOWS:

1. MECHANICAL ROOMS
2. ALL ASSOCIATED RTUS ZONES

BAS SHALL BE WEB (IP) BASED TO ALLOW INTERNET ACCESS FOR REMOTE OPERATION OF ALL SYSTEM FUNCTIONS. BAS SHALL ALLOW GLOBAL OPERATION OF COOLING AND HEATING SETPOINTS. BAS SHALL ALSO ALLOW EITHER ZONE BY ZONE OR GLOBAL OVERRIDE OF SYSTEM EQUIPMENT OPERATION WHILE IN THE UNOCCUPIED MODE. OVERRIDE SHALL ACTIVATE ALL SYSTEM EQUIPMENT, REQUIRED FOR PROPER OPERATION OF OVERRIDDEN EQUIPMENT TO MAINTAIN "OCCUPIED" SPACE CONDITIONS IN THE OVERRIDE ZONE FOR A TIME PERIOD OF 2 HOURS (ADJ.), TIME PERIOD SHALL BE ADJUSTABLE THROUGH THE BAS. ALL BAS COMPONENTS SUCH AS JACE CONTROLLERS, AHU CONTROLLERS, PUMP CONTROLLERS, ETC, SHALL BE FURNISHED WITH A LOCAL UPS WITH SURGE SUPPRESSION SIZED FOR DEVICE CONNECTED WATTAGE, VOLTAGE AND 2 HR. BATTERY OPERATION. UNLESS NOTED OTHERWISE THE OCC. & UNCOCC TEMPERATURE SETPOINTS SHALL BE:
OCCUPIED- 76F CLG / 70F HTG UNCOCCUPIED - 85F CLG / 55F HTG (MECH SPACES 80F CLG / 60F HTG)

DUCT MOUNTED SMOKE DETECTORS:

SMOKE DETECTOR SHALL BE PROVIDED IN THE RETURN DUCT PRIOR TO THE OUTSIDE AIR DUCT CONNECTION. DETECTOR SHALL INTERFACE WITH FIRE ALARM SYSTEM AND SHUT-DOWN UNIT FANS UPON ACTIVATION. A NOTIFICATION ALARM SHALL BE GENERATED WHEN A SMOKE DETECTOR IS ACTIVATED. SMOKE DETECTORS SHALL BE INDICATED ON EQUIPMENT GRAPHICS WITH WHICH DETECTOR IS ASSOCIATED.

MISC. EXHAUST FANS

PROVIDE WALL SWITCHES, WALL THERMOSTATS, INTERLOCKS, ETC. AS INDICATED ON THE FAN SCHEDULE TO CONTROL FANS AS INDICATED ON PLANS.

TOILET EXHAUST FANS

FANS SHALL OPERATE ON A PROGRAMMED SCHEDULE BY BAS.

ROLL UP DOOR INTERLOCK - UNOCCUPIED MODE

THE BAS SYSTEM SHALL PROVIDE A SURFACE MOUNT MAGNETIC CONTACT FOR ALL ROLL UP DOORS IN THE SHOPS / LAB AREAS. CONTACT DEVICE SHALL BE SEALED, AND UTILIZE ARMORED CABLE FOR CONNECTING BACK TO THE BAS.

UPON RECEIVING AN OPEN SINGLE (DOOR OPEN) ALL THE ASSOCIATED UNITS SHALL BE SET TO UNOCCUPIED TEMPERATURE SETPOINTS. UPON THE DOOR BEING CLOSED THE OCCUPIED SETPOINTS SHALL BE RE-INSTATED, WITH MINIMAL DELAY.

ALL SCHEDULED VALUES SHALL BE ADJUSTABLE FOR ALL THE TIME FRAMES.

VARIABLE VOLUME (SINGLE ZONE) ROOF TOP UNITS (RTU-1, 2, 3, 4, 5)

ALL UNITS SHALL BE STOPPED/STARTED ON A PROGRAMMED BASIS THROUGH THE BAS.

WHILE IN THE OCCUPIED MODE, SUPPLY FAN(S) SHALL BE STARTED AND STOPPED BY BAS. UPON PROOF OF AIR FLOW THRU THE SUPPLY FAN, THE SUPPLY FAN SPEED SHALL BE CONTROLLED VIA THE ASSOCIATED VFD AND RAMP TO ASSOCAITED FULL SUPPLY AIRFLOW AS SET BY TEST AND BALANCE.

BAROMETRIC RELIEF DAMPER (RTU-1, 2, 3, 4, 5) SHALL OPEN/CLOSE TO MAINTAIN BUILDING PRESSURE (REFER TO FLOOR PLANS FOR BUILDING PRESSURE SENSOR LOCATION) DURING ECONOMIZER OPERATION, AND BY INTERNAL PACKAGED UNIT INTERNAL CONTROLS.

A DISCHARGE AIR SENSOR SHALL CONTROL UNIT COOLING AND HEATING TO MAINTAIN THE UNIT SUPPLY AIR TEMPERATURE TO STATISFY THE ASSOCAITED SPACE HEATING AND COOLING SETPOINTS.

BAS SHALL PROVIDE ECONOMIZER OPERATION TO PROVIDE "FREE COOLING" WHEN OUTDOOR AIR CONDITIONS ALLOW. UPON BAS DETERMINATION THAT OUTSIDE AIR ENTHALPY IS BELOW RETURN AIR ENTHALPY (2°F DEADBAND) IN COOLING MODE, THE OUTSIDE AIR, RETURN AIR AND RELIEF AIR FANS SHALL MODULATE TO MAINTAIN UNIT DISCHARGE AIR TEMPERATURE. IF "ECONOMIZER" CONTROL IS INSUFFICIENT TO MAINTAIN DISCHARGE AIR TEMPERATURE, THE UNIT COOLING CYCLE SHALL FUNCTION AS OUTLINED ABOVE. UPON A DROP IN DISCHARGE AIR TEMPERATURE BELOW SETPOINT, THE OUTSIDE AIR AND RELIEF AIR FANS SHALL MODULATE CLOSED/OFF UNTIL THE MINIMUM OUTSIDE AIR POSITION IS REACHED. BUILDING PRESSURE SHALL BE MONITORED AND DAMPERS SHALL BE ADJUSTED TO PREVENT AN OVERPRESSURIZATION OF THE SPACE WHERE THE BUILDING PRESSURE SENSORS ARE LOCATED.

CONTROLS SHALL PROVIDE FOR OPTIMAL MORNING WARM-UP AND NIGHT SETBACK DURING UNOCCUPIED TIMES. UPON UNIT START-UP, IF RETURN AIR TEMPERATURE IS BELOW 65°F. (ADJ) OR ABOVE 75°F. (ADJ), THE OUTSIDE AIR DAMPERS SHALL REMAIN CLOSED AND THE HEATING OR COOLING CONTROL SHALL OPERATE THE HEATING OR COOLING AS REQUIRED TO RAISE OR LOWER THE RETURN AIR TEMPERATURE. WHEN RETURN AIR TEMPERATURE RISES ABOVE 62°F. (ADJ) OR FALLS BELOW 78°F. (ADJ), THE UNIT SHALL BE CONTROLLED AS OUTLINED ABOVE.

WHILE IN THE UNOCCUPIED MODE, THE UNIT SUPPLY FAN SHALL BE OFF, HTG/COOLING SHALL BE OFF AND THE SPACE TEMPERATURE SETPOINTS SHALL BE SET TO UNOCCUPIED SETTINGS OF 60° FOR HEATING (ADJ) AND 85° FOR COOLING (ADJ). UPON A CALL FOR HEATING OR COOLING TO MEET UNOCCUPIED SETPOINTS, THE UNIT FAN SHALL BE STARTED AND THE HEATING OR COOLING SHALL OPERATE AS REQUIRED BY THE SPACE TEMPERATURE.

OUTSIDE AIR INTAKE SHALL BE PROVIDED WITH (1) MOTORIZED DAMPERS. ON UNIT START UP, THE O.A. DAMPER SHALL REMAIN CLOSED UNTIL THE RETURN AIR TEMPERATURE RISES ABOVE 65° (ADJ) OR FALLS BELOW 78° (ADJ). ONCE RETURN AIR TEMPERATURE IS SATISFIED, THE O.A. INTAKE DAMPER SHALL BE OPEN TO THE DESIGN OA AIRFLOW POSITION, WHILE THE AIR HANDLING UNIT IS IN THE OCCUPIED MODE, DAMPER SHALL OPEN TO MAINTAIN THE THE DESIGN MINIMUM OUTSIDE AIRFLOW. DAMPER SHALL REMAIN CLOSED WHILE THE UNIT IS IN THE UNOCCUPIED MODE. BAS SHALL BE CAPABLE OF OPENING AND CLOSING OUTSIDE AIR DAMPER.

CO2 SENSOR MOUNTED IN THE SPACE (RETURN DUCT FOR VERIFICATION ONLY) SHALL MODULATE THE OUTSIDE AIR DAMPER BASED ON CO2 LEVELS IN THE SPACE. THE OA DAMPERS SHALL MODULATE AS REQUIRED TO MAINTAIN A SPACE CO2 LEVEL OF 700 PPM ABOVE THE OUTSIDE AIR CO2 LEVEL. AN ALARM SHALL BE ACTIVATED IF THE SPACE C02 LEVEL RISED ABOVE 1200 PPM. OA SHALL BE RESET DOWN TO THE SCHEDULED MIN OA SETPOINT WITH A SETTING EQUAL TO THE ASSOCIATED SYSTEM EXHAUST AIRFLOW RATE BASED ON POLLING ALL ROOM C02 SENSORS AND ADJUSTING OA DAMPER POSITION DOWN UNTIL ALL SPACE C02 SENSORS REMAIN WITH IN ALLOWABLE RANGE AS NOTED ABOVE.

SMOKE DETECTOR SHALL BE PROVIDED IN THE RETURN DUCT (UPSTREAM OF THE OUTSIDE AIR DUCT CONNECTION). DETECTOR SHALL SHUT DOWN ALL UNIT FANS UPON ACTIVATION, SEND ALARM TO BAS.

DEHUMIDIFICATION

UNIT SHALL PROVIDE MODULATION AND CONTROL OF SUPPLY AIR TEMPERATURE VIA HGRH COIL IF RELATIVE HUMIDITY SENSOR IN RETURN DUCT IS ABOVE 55% (ADJ.)

CONTROL SYSTEM COORDINATION NOTES

1. SEE SPECIFICATIONS (SECTION 23 09 00) FOR ADDITIONAL REQUIREMENTS.
2. THE SEQUENCE OF OPERATION AND POINTS LIST IS INTENDED TO COMMUNICATE THE MINIMUM REQUIREMENTS AND GENERAL DESIGN INTENT TO THE CONTROLS CONTRACTOR AND IS NOT INTENDED TO BE A FULLY DEVELOPED OR COMPLETE SEQUENCE OF OPERATION. IN THE CONTROLS SUBMITTAL THE CONTROLS CONTRACTOR SHALL FULLY DEVELOP THE SEQUENCE OF OPERATIONS FOR ALL SYSTEMS IDENTIFIED AND SHALL PRESENT ALL SETPOINTS, CONTROL PARAMETERS, TIME DELAYS, ALARM POINTS, ETC. AS REQUIRED TO COMPLY WITH THE DESIGN INTENT. THE CONTROLS CONTRACTOR SHALL INCORPORATE STANDARD FEATURES SUCH AS MINIMUM RUN TIME DELAYS AND DEAD BANDS TO PREVENT SHORT CYCLING. ALL MONITORED POINTS SHALL INCLUDE EARLY HIGH/LOW ALARM NOTIFICATIONS PRIOR TO REQUIRED CORRECTIVE ACTIONS OR UNIT SHUT-DOWNS. CONTROL CONTRACTOR SHALL SPECIFY IN THE CONTROL SUBMITTAL FAIL SAFE POSITION FOR OUT OF RANGE, FAIL SAFE POSITIONING FOR OPEN CIRCUITS OR LOSS OF COMMUNICATION.
3. SYSTEM SHALL USE GLOBAL OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS FOR PRIMARY SYSTEM OPERATION. LOCAL OUTSIDE AIR TEMPERATURE AND HUMIDITY SENSORS SHALL BE PROVIDED FOR SYSTEM OPERATION UPON LOSS OF NETWORK COMMUNICATION.
4. ALL CONTROL SETPOINTS SHALL BE ADJUSTABLE AND TRENDABLE. INDICATED TEMPERATURE SETPOINTS SHOULD BE USED FOR ORIGINAL SYSTEM SET-UP. ANY CHANGES IN SETPOINT SETTINGS REQUIRED FOR INTENDED SYSTEM OPERATION SHALL BE NOTED ON AS-BUILT CONTROL DRAWINGS.
5. FLOW SWITCHES OR ADJUSTABLE TYPE CURRENT SWITCHES SHALL BE PROVIDED IN THE PIPING OF EACH PUMP TO VERIFY PUMP STATUS.
6. PHOTOELECTRIC TYPE DUCT SMOKE DETECTORS SHALL BE FURNISHED AND WIRED TO THE FIRE ALARM SYSTEM BY THE ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR SHALL INSTALL DETECTORS IN THE DUCT AND WIRE UNIT FROM FIRE ALARM SYSTEM (DRY CONTACTS) FOR UNIT SHUT-DOWN UPON ACTIVATION.
7. ELECTRICAL CONTRACTOR SHALL PROVIDE DEDICATED 120V CIRCUIT(S) IN A J-BOX FOR CONTROL POWER. CONTROLS CONTRACTOR SHALL EXTEND 120V POWER FROM J-BOX TO CONTROL PANELS, DAMPER ACTUATORS, TRANSFORMERS, ETC. AS REQUIRED FOR OPERATION OF CONTROL SYSTEM.
8. BAS SHALL ALLOW GLOBAL OPERATION OF CHILLED WATER CONTROL VALVES.
9. ALL CONTROL PANELS AND COMPONENTS SHALL BE UL LISTED
10. LOCATE MAIN DDC CONTROL PANEL(S) MECHANICAL ROOMS AS INDICATED ON PLANS COORDINATE EXACT LOCATION PANEL WITH ALL OTHER TRADES PRIOR TO INSTALLATION.
11. OUTDOOR TEMP/HUMIDITY SENSOR SHALL BE PROVIDED WITH AND ACCURACY OF +/- 2.5%
12. PROOF OF STATUS FOR UTILITY BEING MONITORED SHALL BE ACCOMPLISHED DIRECTLY, NOT INDIRECTLY; VIA CURRENT SENSOR MONITORING FOR PROOF OF STATUS
13. ALL AVAILABLE POINTS SHALL BE INTEGRATED BACK TO THE BAS FROM ASSOCIATED DEVICES, EQUIPMENT. I.E. VFDS, CHILLERS, PRTUS, ETC.

CONTROL SYSTEM DEVICE NOTES

1. DIRECT DIGITAL CONTROL (DDC) TECHNOLOGY SHALL BE USED TO PROVIDE THE FUNCTIONS NECESSARY FOR CONTROL OF MECHANICAL SYSTEMS.
2. THE CONTROL SYSTEM SHALL BE DESIGNED SUCH THAT IN THE EVENT OF A NETWORK COMMUNICATION FAILURE, OR THE LOSS OF ANY OTHER CONTROLLER, THE CONTROL SYSTEM SHALL CONTINUE TO INDEPENDENTLY OPERATE UNDER CONTROL.
3. OWNER SHALL PROVIDE WAN/LAN CONNECTION TO THE BUILDING AUTOMATION SYSTEM.
4. NIAGRA PROTOCAL SHALL BE USED FOR WORKBENCH TO DAEMON COMMUNICATION
5. UNIT LEVEL CONTROLLERS SHALL USE BACNET MSTP PROTOCOL. CONTROLLERS SHALL BE BACNET BTL CERTIFIED.
6. THE SYSTEM MUST BE PROVIDED, INSTALLED, WIRED AND PROGRAMED BY THE MANUFACTURER'S LOCAL FACTORY OFFICE OR INDEPENDENT CONTROLS SPECIFIC CONTRACTORS. BIDS BY WHOLESALERS, CONTRACTORS OR FRANCHISED DEALERS OR ANY OTHER FIRM WHOSE PRINCIPLE BUSINESS IS NOT THAT OF MANUFACTURING AND INSTALLING BUILDING AUTOMATION SYSTEM IS NOT ACCEPTABLE.
7. PROVIDE ONE YEAR PARTS AND LABOR WARRANTY OF THE BAS.
8. PROVIDE 8HR (2) 4HR SESSIONS OF OWNER'S TRAINING AT JOBSITE ON THE BUILDING AUTOMATION SYSTEM OPERATION.

THE SYSTEM SHALL HAVE THE FOLLOWING FUNCTIONS:

1. TIME OF DAY SCHEDULING INCLUDING OPTIMAL START/STOP, HOLIDAY AND EXCEPTION SCHEDULES.
2. TIMED OVERRIDE BASED ON DURATION LIMIT OR FIXED UNTIL RELEASED.
3. DATA LOGGING AND TRENDING.
4. USER SECURITY LEVEL ASSIGNMENT.
5. SYSTEM AND ALARMS REPORTS.
6. FLOOR PLANS, SYSTEM, EQUIPMENT GRAPHICS WITH DYNAMIC DATA DISPLAY.
7. ALARM E-MAIL ROUTING.
8. GLOBAL NAVIGATION ICONS TO MANAGE ALARMS, USER CREDENTIALS, HELP FUNCTIONS.
9. SUPPORT A MINIMUM OF 10 CONCURRENT USERS.
10. FULL SEQUENCE OF OPERATION PAGE
11. ONE CLICK TREND(S) NEXT TO EACH POINT MIN 2 WEEKS OF DATA
12. EQUIPMENT DATA PAGE
13. DEMAND CONTROL VENTILATION OPTIMIZATION AS DEFINED BY ASHRAE 62.1.
14. ALL INTEGRATION FROM EXTERIOR SYSTEMS (LIGHTING CONTROLS, ETC.) SHALL BE INCLUDED WITH THE SCOPE OF THIS PROJECT AS DEFINED WITH IN THIS PROJECT OR AS IMPLIED THROUGH NOTES AND OTHER DIVISIONS BY APPLICABLE TRADES (DIVISION 23, 22, 26, 28)
15. PROVIDE GRAPHICS REVIEW WITH OWNER PRIOR TO FINAL SYSTEM COMISSIONING AND TURNOVER
16. ALL EXTERIOR CONNECTIONS TO EXTERNAL WAN/LAN SHALL BE COORDINATED WITH OWNER IT DEPARTMENT
17. FINAL INTEGRATION INTO EXTERNAL WEB BAS ACCESS PLATFORM SHALL BE COORDINATED WITH OWNER

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3/3/25

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BID DOCUMENTS

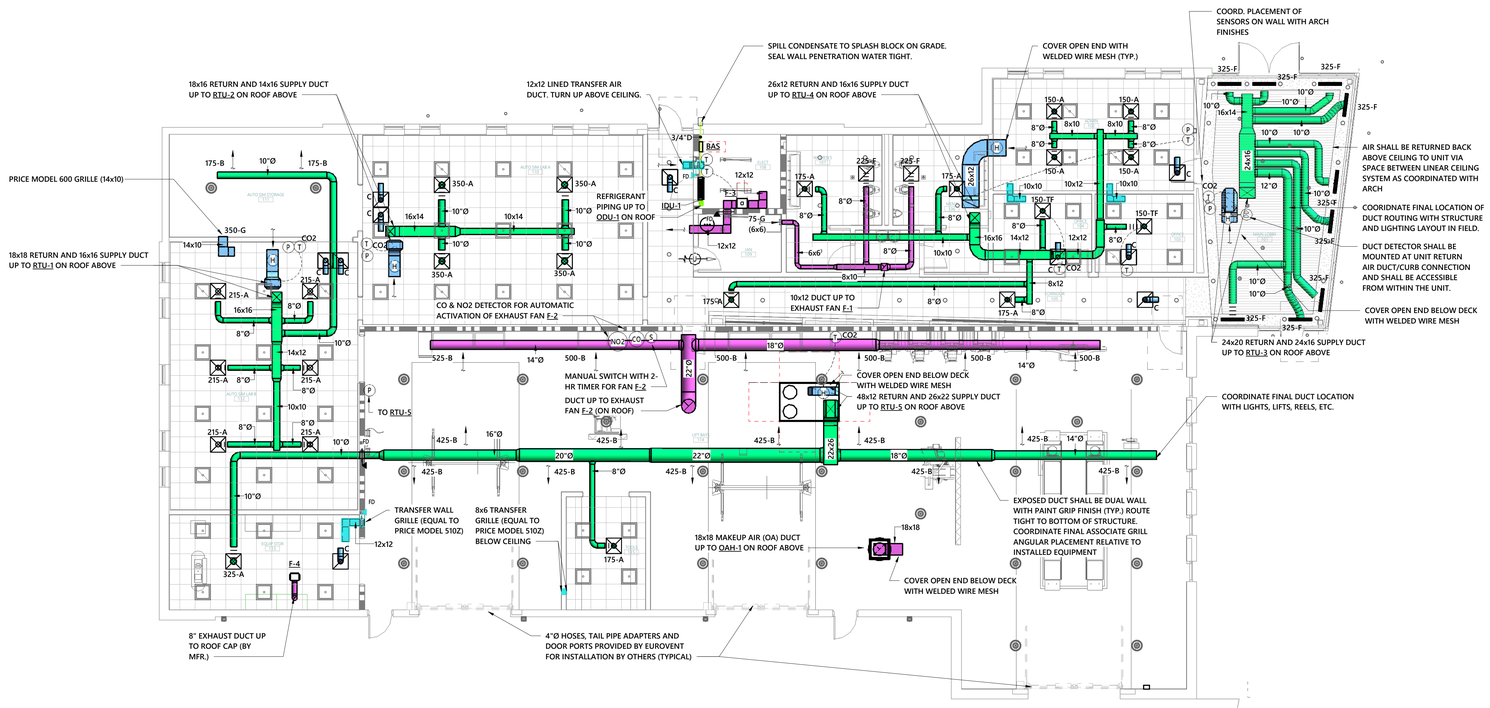
MECHANICAL SEQUENCE & POINTS LIST

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
M003

Opt # 23-0128



1 **MECHANICAL FLOOR PLAN**
1/8" = 1'-0"

LIFE SAFETY PLAN LEGEND:

2 HOUR RATED WALL. UL U905 / U419

N TRUE NORTH

N PLAN NORTH

0 5 10 20
SCALE: 1/8" = 1'-0"

Opt # 23-0128

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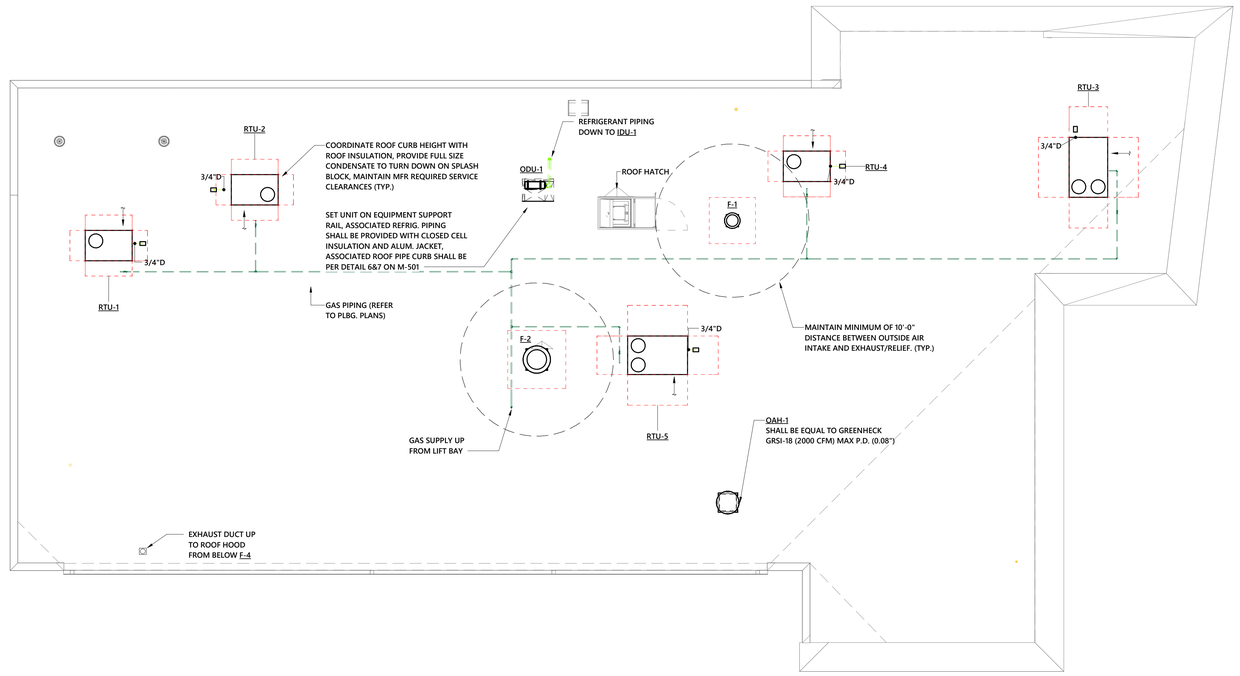
MECHANICAL FLOOR PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
M101



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

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

N TRUE NORTH

N PLAN NORTH

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MECHANICAL ROOF PLAN

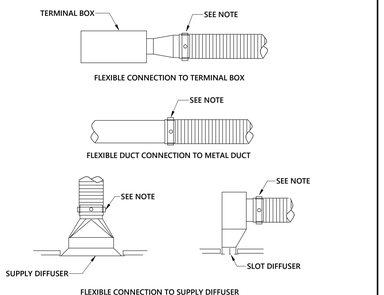
DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS

NO:	DATE:	DESCRIPTION:

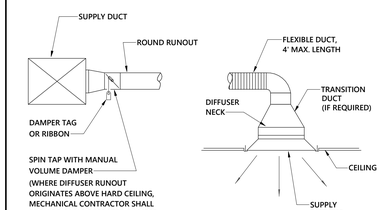
SHEET NUMBER

M102



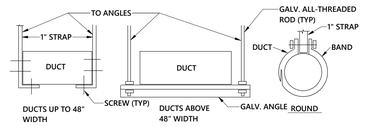
NOTE:
ALL FLEXIBLE DUCT CONNECTIONS TO SHEET METAL SHALL BE SECURED WITH
NYLON STRAP AND 2 SHEET METAL SCREWS (MIN.).

1 FLEX. CONNECTION DETAIL
NO SCALE



NOTE:
ALL MANUAL VOLUME DAMPERS (FOR INSULATED DUCTWORK) SHALL BE PROVIDED WITH AN ELEVATED REGULATOR (STAND-OFF). STAND SHALL EXTEND A MINIMUM OF 2" BEYOND DUCTWORK WITH EXTENDED TAB/SHAFT.

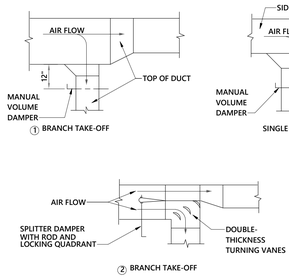
2 SPIN TAP TO DIFFUSER
NO SCALE



LOW PRESSURE DUCTWORK

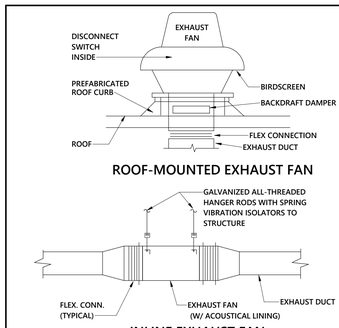
NOTE:
1. PROVIDE ALUMINUM OR STAINLESS STEEL SUPPORTS/RAILS/ANGLES/ETC. FOR ALL DUCTWORK INSTALLED IN POOL EQUIPMENT ROOMS AND ASSOCIATED AREAS

3 DUCTWORK HANGER DETAILS
NO SCALE



NOTE:
1. USE BRANCH TAKE-OFF 1 WHEN MAIN AND BRANCH DUCTS ARE DIFFERENT DEPTHS
2. USE BRANCH TAKE-OFF 2 WHEN MAIN AND BRANCH DUCTS ARE SAME DEPTHS

4 DUCTWORK DETAILS
NO SCALE

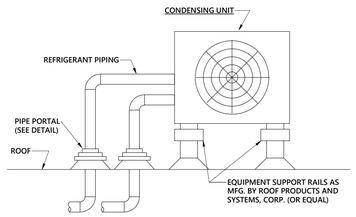


ROOF-MOUNTED EXHAUST FAN

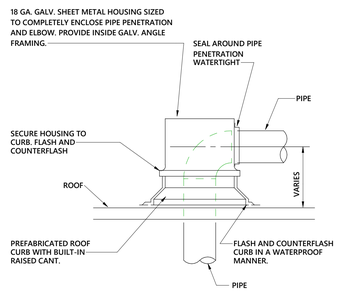
INLINE EXHAUST FAN

NOTES:
1. COORDINATE LOCATION OF FAN WITH OTHER TRADES TO INSURE SERVICE CLEARANCES.
2. MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOOR IN CEILING IF REQUIRED.
3. PROVIDE HOT-DIPPED GALVANIZED SUPPORTS/RAILS/ANGLES/ETC. FOR ALL FANS INSTALLED IN POOL EQUIPMENT ROOMS AND ASSOCIATED AREAS

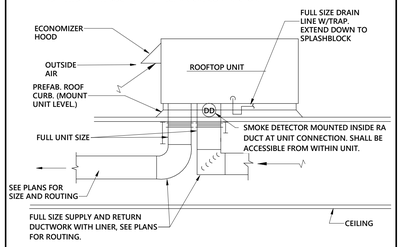
5 EXHAUST FAN DETAIL
NO SCALE



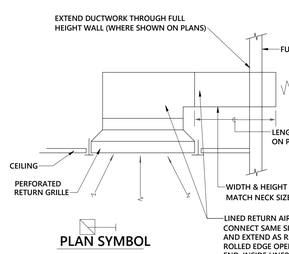
6 ROOF - MOUNTED CONDENSING UNIT
NOT TO SCALE



7 ROOF PIPE PORTAL DETAIL
NO SCALE



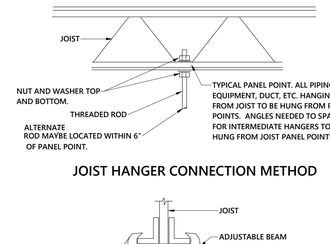
8 RTU DETAIL
NOT TO SCALE



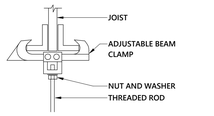
PLAN SYMBOL

NOTE:
1. ROUND NECK RETURN GRILLES ARE SIMILAR. SOUND ATTENUATION DUCT AND ELBOW SHALL BE NECK SIZE OF GRILLE.

9 RETURN GRILLE WITH SOUND ATTENUATION
NO SCALE



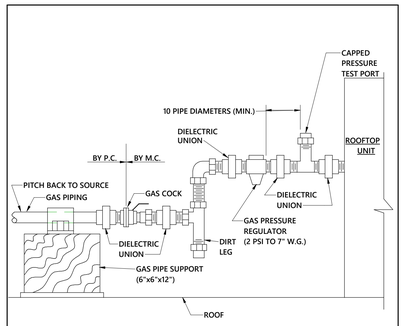
JOIST HANGER CONNECTION METHOD



ALTERNATE JOIST HANGER CONNECTION METHOD

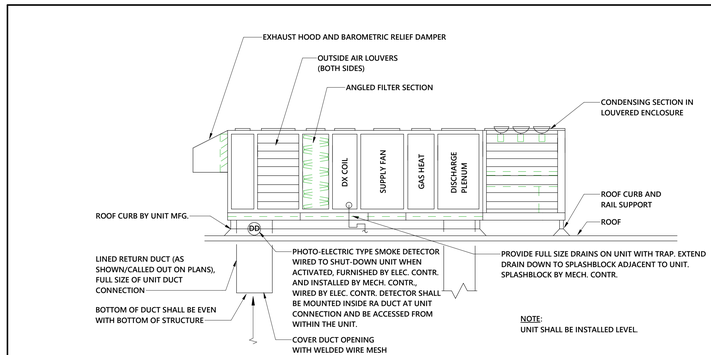
NOTE
1. PROVIDE HOT-DIPPED GALVANIZED SUPPORTS/RAILS/ANGLES/ETC. FOR ALL DUCTWORK INSTALLED IN POOL EQUIPMENT ROOMS AND ASSOCIATED AREAS

10 JOIST CONNECTION DETAIL
NO SCALE



NOTE:
GAS PIPING AND SHUT-OFF VALVE SHALL BE BY PLBG. CONTR., DIRT LEG, REGULATOR, AND FINAL CONNECTION TO UNIT SHALL BE BY MECH. CONTR.

12 GAS CONNECTION TO RTU (WITH REGULATOR)
NOT TO SCALE



13 RTU DETAIL
NOT TO SCALE

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MECHANICAL DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

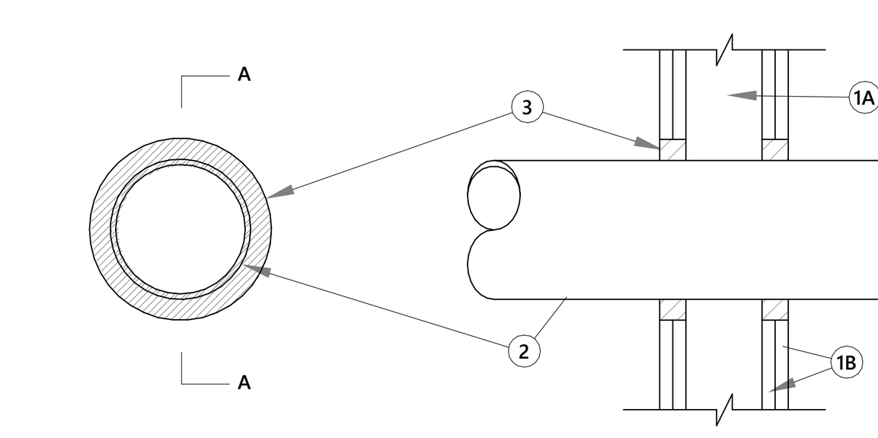
SHEET NUMBER
M501

Opt # 23-0128

System No. W-L-1054

METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F Ratings - 1 and 2 Hr (See Items 1 and 3)
T Rating - 0 Hr
L Rating At Ambient - Less Than 1 CFM/Sq Ft
L Rating At 400 F - 4 CFM/Sq Ft



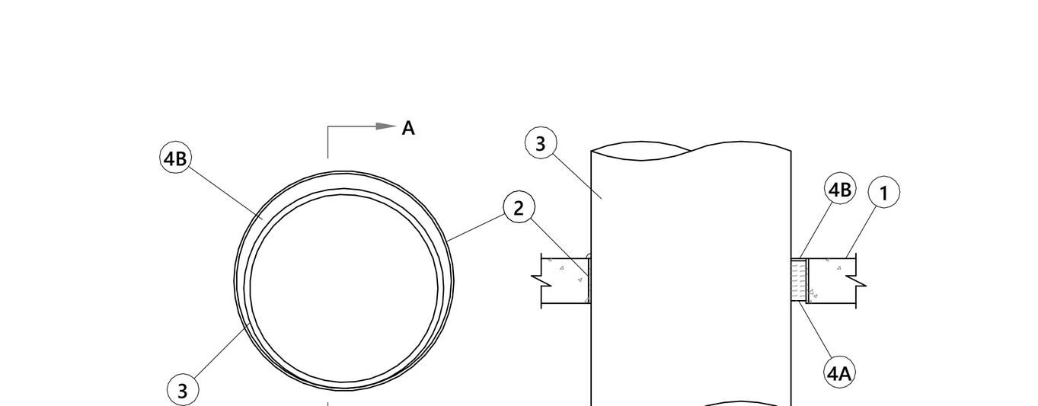
2. THROUGH-PENETRANTS -- ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE SHALL BE MIN 0 IN. TO MAX 2-1/4 IN. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PIPE, CONDUIT OR TUBING MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45 DEGREES FROM PERPENDICULAR. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
A. STEEL PIPE -- NOM 30 IN DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE -- NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. CONDUIT -- NOM 4 IN DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR 6 IN. DIAM STEEL CONDUIT.
D. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
E. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND WALL, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE WALL INTERFACE ON BOTH SURFACES OF WALL .
*BEARING THE UL CLASSIFICATION MARK
1. WALL ASSEMBLY -- THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC. WHEN STEEL STUDS ARE USED AND THE DIAM OF OPENING EXCEEDS THE WIDTH OF STUD CAVITY, THE OPENING SHALL BE FRAMED ON ALL SIDES USING LENGTHS OF STEEL STUD INSTALLED BETWEEN THE VERTICAL STUDS AND SCREW-ATTACHED TO THE STEEL STUDS AT EACH END. THE FRAMED OPENING IN THE WALL SHALL BE 4 TO 6 IN. WIDER AND 4 TO 6 IN. HIGHER THAN THE DIAM OF THE PENETRATING ITEM SUCH THAT, WHEN THE PENETRATING ITEM IS INSTALLED IN THE OPENING, A 2 TO 3 IN. CLEARANCE IS PRESENT BETWEEN THE PENETRATING ITEM AND THE FRAMING ON ALL FOUR SIDES.
B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 32-1/4 IN. FOR STEEL STUD WALLS. MAX DIAM OF OPENING IS 14-1/2 IN. FOR WOOD STUD WALLS.
THE F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE FIRE RATING OF THE WALL ASSEMBLY.

1 U.L SYSTEM NO W-L-1054 DETAIL
NO SCALE

System No. C-AJ-1226

METAL PIPE THROUGH CONCRETE WALL ASSEMBLY

F Rating — 3 Hr
T Rating — 0 Hr
L Rating At Ambient — Less Than 1 CFM/Sq Ft
L Rating At 400 F — 4 CFM/Sq Ft



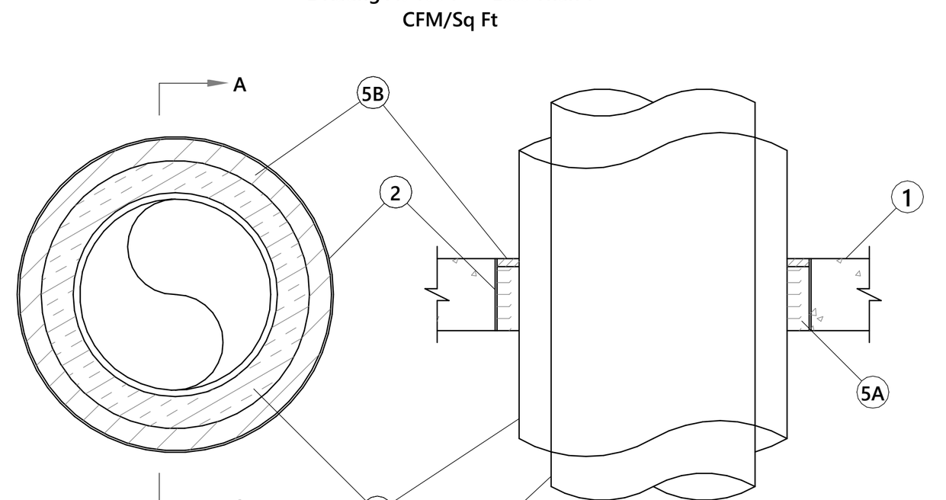
1. FLOOR OR WALL ASSEMBLY -- MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 32 IN.
2. METALLIC SLEEVE -- (OPTIONAL) NOM 32 IN. DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY, FLUSH WITH FLOOR OR WALL SURFACES OR EXTENDING A MAX OF 3 IN. ABOVE FLOOR OR BEYOND BOTH SURFACES OF WALL.
2A. SHEET METAL SLEEVE -- (OPTIONAL) MAX 6 IN. DIAM, MIN 26 GA GALV STEEL PROVIDED WITH A 26 GA GALV STEEL SQUARE FLANGE SPOT WELDED TO THE SLEEVE AT APPROX MID-HEIGHT, OR FLUSH WITH BOTTOM OF SLEEVE IN FLOORS, AND SIZED TO BE A MIN OF 2 IN. LARGER THAN THE SLEEVE DIAM. THE SLEEVE IS TO BE CAST IN PLACE AND MAY EXTEND A MAX OF 4 IN. BELOW THE BOTTOM OF THE DECK AND A MAX OF 1 IN. ABOVE THE TOP SURFACE OF THE CONCRETE FLOOR.
2B. SHEET METAL SLEEVE -- (OPTIONAL) - MAX 12 IN. DIAM, MIN 24 GA GALV STEEL PROVIDED WITH A 24 GA GALV STEEL SQUARE FLANGE SPOT WELDED TO THE SLEEVE AT APPROX MID-HEIGHT, OR FLUSH WITH BOTTOM OF SLEEVE IN FLOORS, AND SIZED TO BE A MIN OF 2 IN. LARGER THAN THE SLEEVE DIAM. THE SLEEVE IS TO BE CAST IN PLACE AND MAY EXTEND A MAX OF 4 IN. BELOW THE BOTTOM OF THE DECK AND A MAX OF 1 IN. ABOVE THE TOP SURFACE OF THE CONCRETE FLOOR.
3. THROUGH-PENETRANT -- ONE METALLIC PIPE, TUBE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PENETRANT AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-7/8 IN. PENETRANT MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PENETRANT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PENETRANTS MAY BE USED:
A. STEEL PIPE -- NOM 30 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE -- NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
D. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
E. CONDUIT -- NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT.
F. CONDUIT -- NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT).
4. FIRESTOP SYSTEM -- THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
A. PACKING MATERIAL -- MIN 4 IN. THICKNESS OF MIN 4 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR SLEEVE OR FROM BOTH SURFACES OF WALL OR SLEEVE AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
B. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 1/4 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR SLEEVE OR WITH BOTH SURFACES OF WALL OR SLEEVE. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PENETRANT AND CONCRETE OR SLEEVE, A MIN 1/4 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE CONCRETE OR SLEEVE/ PIPE PENETRANT INTERFACE ON THE TOP SURFACE OF FLOOR AND ON BOTH SURFACES OF WALL.
*BEARING THE UL CLASSIFICATION MARK

2 U.L SYSTEM NO C-AJ-1226 DETAIL
NO SCALE

System No. C-AJ-5091

INSULATED METAL PIPE THROUGH CONCRETE WALL ASSEMBLY

F Rating — 2 Hr
T Rating — 1 Hr
L Rating At Ambient — 4 CFM/Sq Ft
L Rating At 400 F — Less Than 1 CFM/Sq Ft



1. FLOOR OR WALL ASSEMBLY — MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 19-1/2 IN. SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

2. METALLIC SLEEVE — (OPTIONAL) — NOM 20 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
2A. SHEET METAL SLEEVE — (OPTIONAL) - MAX 6 IN. DIAM, MIN 26 GA GALV STEEL PROVIDED WITH A 26 GA GALV STEEL SQUARE FLANGE SPOT WELDED TO THE SLEEVE AT APPROXIMATELY MID- HEIGHT, OR FLUSH WITH BOTTOM OF SLEEVE IN FLOORS, AND SIZED TO BE A MIN OF 2 IN. LARGER THAN THE SLEEVE DIAM. THE SLEEVE IS TO BE CAST IN PLACE FLUSH WITH BOTTOM SURFACE OF FLOOR AND MAY EXTEND A MAX OF 1 IN. ABOVE THE TOP SURFACE OF THE FLOOR.

2B. SHEET METAL SLEEVE — (OPTIONAL) - MAX 12 IN. DIAM, MIN 24 GA GALV STEEL PROVIDED WITH A 24 GA GALV STEEL SQUARE FLANGE SPOT WELDED TO THE SLEEVE AT APPROXIMATELY MID- HEIGHT, OR FLUSH WITH BOTTOM OF SLEEVE IN FLOORS, AND SIZED TO BE A MIN OF 2 IN. LARGER THAN THE SLEEVE DIAM. THE SLEEVE IS TO BE CAST IN PLACE FLUSH WITH BOTTOM SURFACE OF FLOOR AND MAY EXTEND A MAX OF 1 IN. ABOVE THE TOP SURFACE OF THE FLOOR.

3. THROUGH PENETRANTS — ONE METALLIC PIPE OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:

A. STEEL PIPE — NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE — NOM 12 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. COPPER PIPE — NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
D. COPPER TUBING — NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

4. PIPE COVERING -- NOM 2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL-SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED, SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT TAPE SUPPLIED WITH THE PRODUCT. THE ANNULAR SPACE BETWEEN THE INSULATED PIPE AND THE EDGE OF THE PERIPHERY OF THE OPENING SHALL BE MIN 1/2 IN. TO A MAX 2-1/4 IN. E-017,L0.4;SEE PIPE EQUIPMENT COVERING -- MATERIALS -- (BRGU) CATEGORY IN THE BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.
4A. PIPE COVERING -- (NOT SHOWN) -- AS AN ALTERNATE TO ITEM 4, MAX 2 IN. THICK CYLINDRICAL CALCIUM SILICATE (MIN 14 PCF) UNITS SIZED TO THE OUTSIDE DIAM OF THE PIPE OR TUBE MAY BE USED. PIPE INSULATION SECURED WITH STAINLESS STEEL BANDS OR MIN 8 AWG STAINLESS STEEL WIRE SPACED MAX 12 IN. OC. THE ANNULAR SPACE SHALL BE MIN 1/2 IN. TO MAX 2-1/4 IN.

5. FIRESTOP SYSTEM -- THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
A. PACKING MATERIAL -- MIN 4 IN. THICKNESS OF MIN 4 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
B. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 1/2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR OR WITH BOTH SURFACES OF WALL.

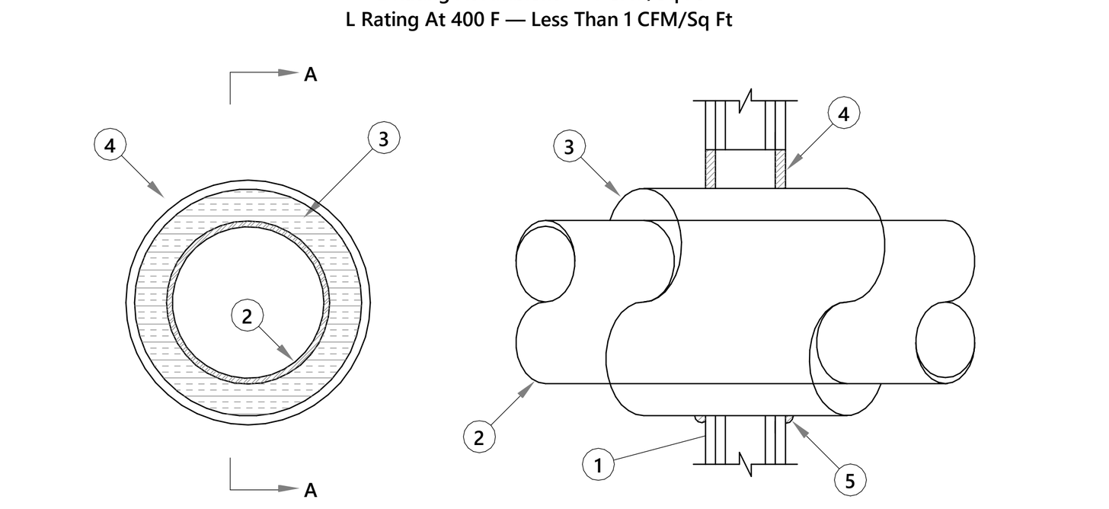
*BEARING THE UL CLASSIFICATION MARK

3 U.L SYSTEM NO C-AJ-5091 DETAIL
NO SCALE

System No. W-L-5029

INSULATED METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F Ratings — 1 and 2 Hr (See Item 1)
T Ratings — 1/2, 3/4, 1, 1-1/2 and 1-3/4 Hr (See Item 3)
L Rating At Ambient — 4 CFM/Sq Ft
L Rating At 400 F — Less Than 1 CFM/Sq Ft



1. WALL ASSEMBLY -- THE 1 OR 2 HR FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE, WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 18-5/8 IN.
THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.
2. THROUGH PENETRANTS -- ONE METALLIC PIPE OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
A. STEEL PIPE -- NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE -- NOM 12 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
D. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. PIPE COVERING* -- NOM 1, 1-1/2 OR 2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT TAPE SUPPLIED WITH THE PRODUCT.
SEE PIPE AND EQUIPMENT COVERING - MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIAL DIRECTORY FOR THE NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INCEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.
THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT ON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, THE SIZE AND TYPE OF THROUGH PENETRANT AND THE PIPE COVERING THICKNESS, AS SHOWN IN THE TABLE BELOW:

Wall Assembly Rating	Through Penetrant		Pipe Covering Thkns	Annular Space		T Rating Hr
	Type +	Max Diam In.		Min In.	Max In.	
Hr	A	4	In.	0	1-1/2	1/2
1	B or C	2	1 or 1-1/2	0	1-1/2	1/2
1	A	4	1-1/2	0	1-1/2	1
1	A	12	2	0	1-7/8	3/4
1	B or C	6	2	0	1-7/8	1
2	A	4	1	0	1-1/2	1
2	B or C	4	1 or 1-1/2	0	1-1/2	1
2	B or C	6	2	0	1-7/8	1
2	A	4	1-1/2	0	1-1/2	1-3/4
2	A	12	2	0	1-7/8	1-1/2
2	B or C	6	2	0	1-7/8	1

+INDICATES PENETRANT TYPE AS ITEMIZED IN ITEM 2.
3A. PIPE COVERING* -- (NOT SHOWN) -- AS AN ALTERNATE TO ITEM 3, MAX 2 IN. THICK CYLINDRICAL CALCIUM SILICATE (MIN 14 PCF) UNITS SIZED TO THE OUTSIDE DIAM OF THE PIPE OR TUBE MAY BE USED. PIPE INSULATION SECURED WITH STAINLESS STEEL BANDS OR MIN 8 AWG STAINLESS STEEL WIRE SPACED MAX 12 IN. OC. WHEN THE ALTERNATE PIPE COVERING IS USED, THE T RATING SHALL BE DETERMINED FROM THE TABLE ABOVE.
SEE PIPE AND EQUIPMENT COVERING -- MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

4. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL . AT THE POINT CONTACT LOCATION BETWEEN PIPE COVERING AND GYPSUM BOARD, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE COVERING/GYPSUM BOARD INTERFACE ON BOTH SURFACES OF WALL.
*BEARING THE UL CLASSIFICATION MARK

4 U.L SYSTEM NO W-L-5029 DETAIL
NO SCALE

PIPE AND DUCTWORK WALL PENETRATION NOTES (MECHANICAL)

1. ALL INSULATED METAL PIPING PENETRATING A ONE HOUR OR MORE RATED ASSEMBLY SHALL BE SEALED AROUND INSULATION ON BOTH SIDES OF WALL WITH AN APPROVED FIRE STOP WRAP/STRIP MATERIAL. NUMBER OF WRAPS AROUND INSULATION WITHIN WALL OPENING SHALL BE AS REQUIRED FOR THICKNESS OF INSULATION AND MFG. RECOMMENDATIONS. COVER EXPOSED SURFACE AND SEAMS WITH AN APPROVED FIRE STOP CAULK ON BOTH SIDES OF WALL.
2. ALL NON-INSULATED METAL PIPING PENETRATING A ONE HOUR WALL OR MORE RATED WALL OR FLOOR SHALL BE SEALED AROUND PIPE ON BOTH SIDES OF WALL WITH AN APPROVED FIRE STOP CAULK. THICKNESS SHALL BE AS RECOMMENDED BY MANUFACTURER FOR WALL RATING REQUIRED TO MAINTAIN U.L. CLASSIFICATION.
3. ALL DUCTWORK PENETRATING A TWO HOUR OR MORE RATED WALL OR FLOOR SHALL BE PROVIDED WITH A FIRE DAMPER INSTALLED AS DETAILED.
4. NO FLEXIBLE DUCTWORK WILL BE ALLOWED TO PENETRATE ONE HOUR WALLS, TWO HOUR WALLS, SMOKE WALLS, CORRIDOR WALLS OR WALLS CLOSED-OFF TO STRUCTURE. METAL RIGID DUCTWORK SHALL EXTEND A MINIMUM OF 5'-0" FROM WALL BEFORE THE FIRST AIR DISTRIBUTION DEVICE IS INSTALLED OR BEFORE FLEXIBLE DUCT IS STARTED. FLEXIBLE DUCTWORK IN A SINGLE DUCT RUN IS ALLOWED ON ONE SIDE OF A RATED WALL BUT NOT BOTH SIDES.
5. ACCEPTABLE MANUFACTURERS OF FIRE STOP MATERIALS ARE AS FOLLOWS:

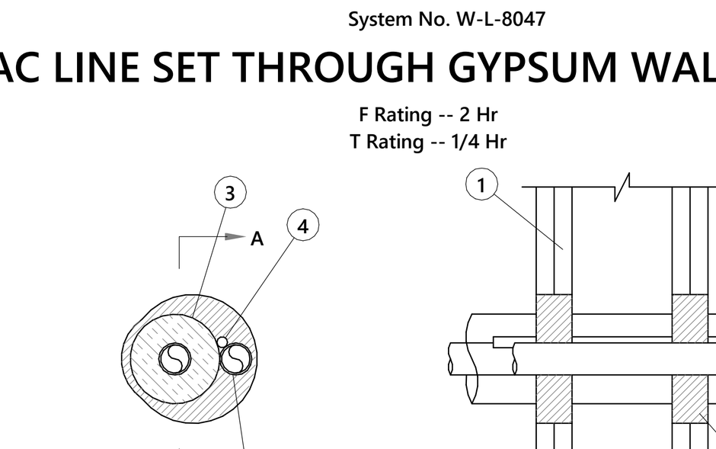
   NELSON FLAMESEAL PUTTY+
   CROUSE-HINDS CABLE BARRIER SYSTEM
   DOW CORNING FIRE STOP SEALANT/FOAM
   3M FIRE BARRIER
   T&B FLAMESAFE
   THERMAFIBER BRAND SAFING

   ALL MATERIALS AND METHODS OF INSTALLATION SHALL BE U.L. APPROVED FOR THAT INSTALLATION. SHOP DRAWING SUBMITTALS OF MATERIALS AND METHOD OF INSTALLATION, INCLUDING DRAWINGS, SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW.
6. WHEN A PIPE, WIRE, OR DUCT PENETRATES A NON-RATED SMOKETIGHT PARTITION, THE MECHANICAL CONTRACTOR SHALL SEAL AROUND ALL PIPES WIRES AND DUCTS WITH SEALANT MATERIAL TO MAKE IT SMOKETIGHT. SEE ARCHITECTURAL PLANS FOR LOCATION OF THESE PARTITIONS.
7. SEE ARCHITECTURAL PLANS FOR WALL TYPES.
8. ALL RATED WALL PENETRATIONS SHALL BE IN ACCORDANCE WITH UNDERWRTIERS LABORATORIES PENETRATION FIRESTOP SYSTEM REQUIREMENTS. ALL MATERIALS USED IN PENETRATION FIRESTOP SYSTEMS SHALL BE APPROVED BY UNDERWRITERS LABORATORIES AND SHALL BE U.L. LABELED.

System No. W-L-8047

HVAC LINE SET THROUGH GYPSUM WALL ASSEMBLY

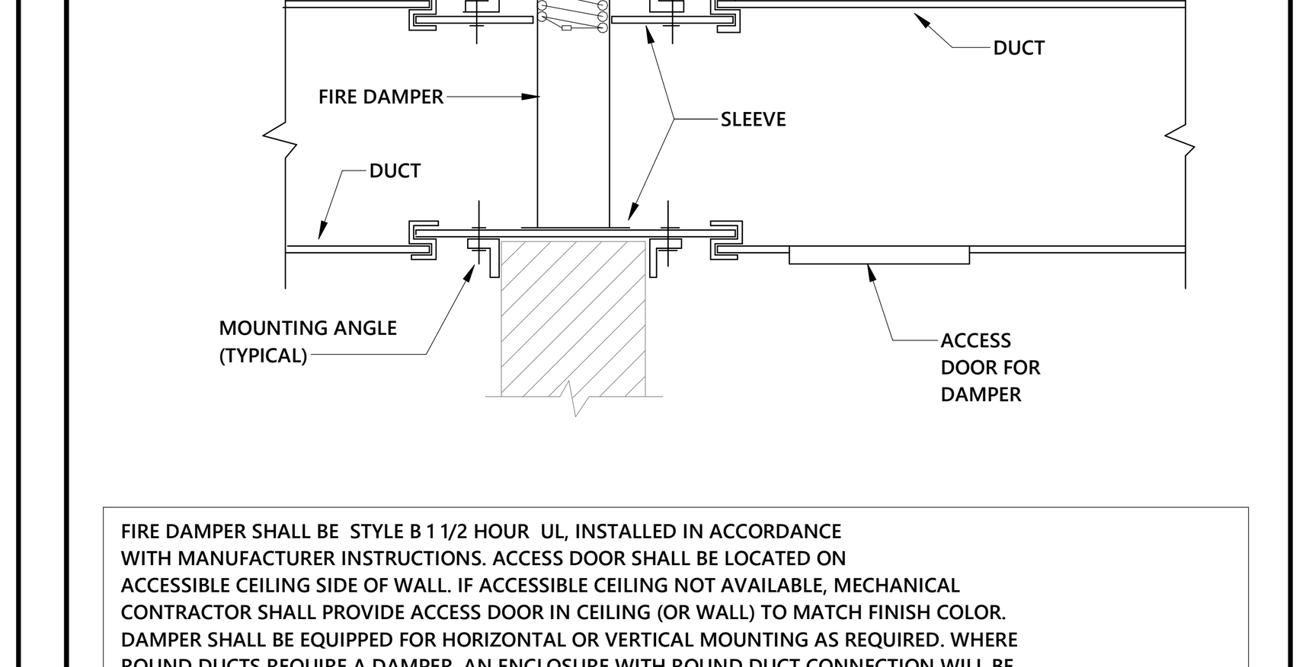
F Rating -- 2 Hr
T Rating -- 1/4 Hr



1. WALL ASSEMBLY -- THE 2 HR FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
A. STUDS -- WALL FRAMING SHALL CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED MAX 16 IN. OC. STEEL STUDS TO BE MIN 3-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
B. GYPSUM BOARD* -- THE GYPSUM BOARD TYPE, THICKNESS NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 4-1/2 IN.
2. THROUGH PENETRANTS -- ONE OR MORE PIPE OR TUBING TO BE INSTALLED CONCENTRICALLY OR ECCENTRICALLY WITHIN THE OPENING. THE SPACE BETWEEN ANY PENETRANT AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-1/4 IN. PIPES OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
A. COPPER TUBE -- NOM 1 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBE.
B. COPPER PIPE -- NOM 1 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. TUBE INSULATION - PLASTICS+ -- NOM 3/4 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. TUBE INSULATION TO BE INSTALLED ON ONE OR MORE OF THE METALLIC PIPES OR TUBES.
SEE PLASTICS+ (QMFZ2) CATEGORY IN THE PLASTICS RECOGNIZED COMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT TUBE INSULATION MATERIAL MEETING THE ABOVE SPECIFICATIONS AND HAVING A UL 94 FLAMMABILITY CLASSIFICATION OF 94-5VA MAY BE USED.
4. CABLES -- MAX OF ONE 4 PAIR NO. 18 AWG (OR SMALLER) CABLE WITH PVC INSULATION AND JACKET MATERIALS.
5. FILL, VOID OR CAVITY MATERIAL - SEALANT* -- MIN 1-1/4 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS BETWEEN PENETRANTS AND GYPSUM BOARD, FLUSH WITH BOTH SURFACES OF WALL. AT POINT CONTACT, A 1/4 IN. BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PENETRANT/GYPSUM BOARD INTERFACE ON BOTH SIDES OF WALL.

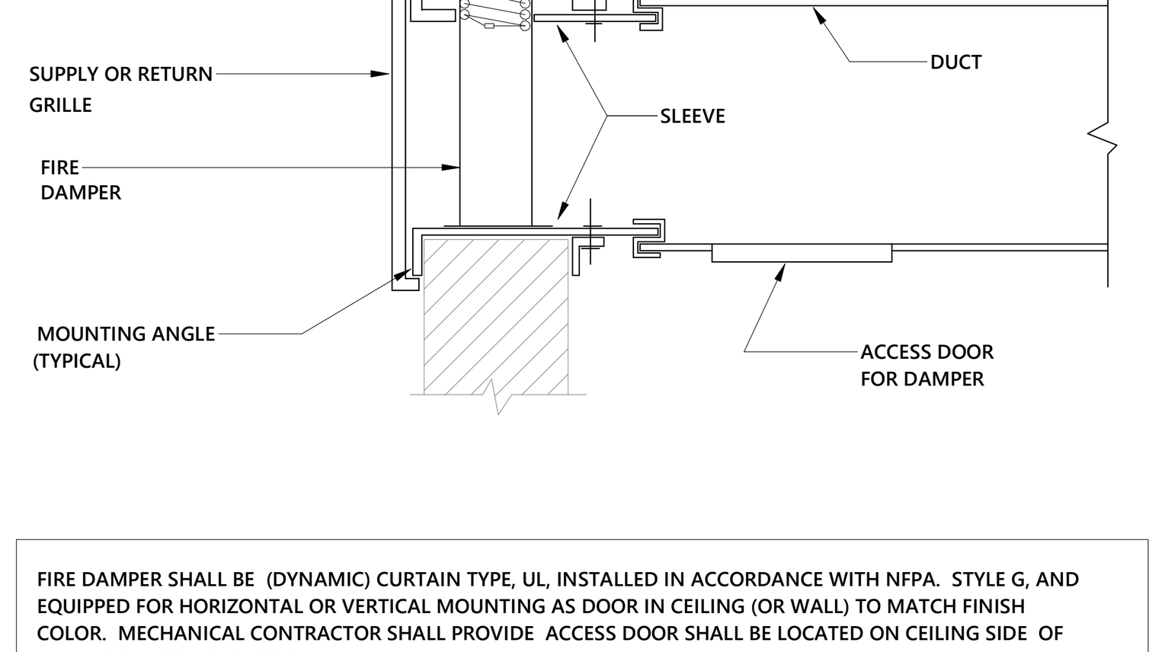
*BEARING THE UL CLASSIFICATION MARK

5 U.L SYSTEM NO W-L-8047 DETAIL
NO SCALE



FIRE DAMPER SHALL BE STYLE B 1 1/2 HOUR UL, INSTALLED IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS. ACCESS DOOR SHALL BE LOCATED ON ACCESSIBLE CEILING SIDE OF WALL. IF ACCESSIBLE CEILING NOT AVAILABLE, MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOOR IN CEILING (OR WALL) TO MATCH FINISH COLOR. DAMPER SHALL BE EQUIPPED FOR HORIZONTAL OR VERTICAL MOUNTING AS REQUIRED. WHERE ROUND DUCTS REQUIRE A DAMPER, AN ENCLOSURE WITH ROUND DUCT CONNECTION WILL BE REQUIRED WITH TYPE B DAMPER INSIDE.

6 LOW PRESSURE FIRE DAMPER DETAIL
NO SCALE

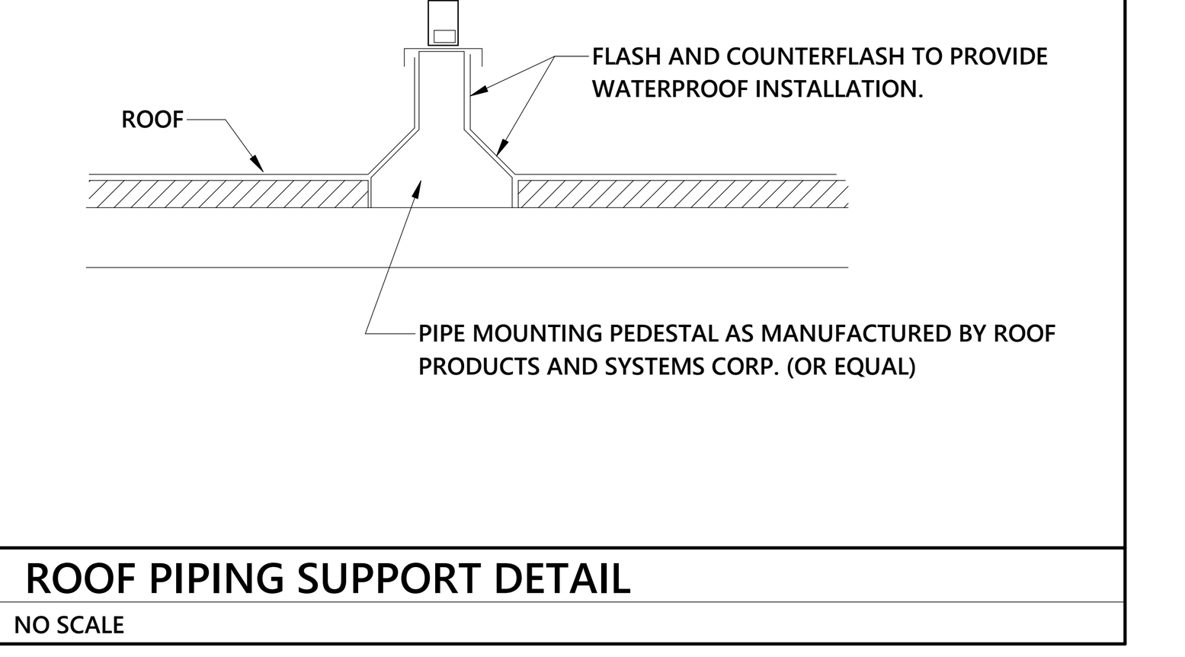


FIRE DAMPER SHALL BE (DYNAMIC) CURTAIN TYPE, UL, INSTALLED IN ACCORDANCE WITH NFPA. STYLE G, AND EQUIPPED FOR HORIZONTAL OR VERTICAL MOUNTING AS DOOR IN CEILING (OR WALL) TO MATCH FINISH COLOR. MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOOR SHALL BE LOCATED ON CEILING SIDE OF WALL. OF ACCESSIBLE CEILING.

NOTE: THIS TYPICAL FIRE DAMPER DETAIL IS GENERIC GUIDANCE ONLY. INSTALL FIRE DAMPERS IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION DETAILS. DO NOT VARY FROM THOSE INSTRUCTIONS IN ANY WAY. DO NOT FIRESTOP THE GAP BETWEEN THE FIRE DAMPER SLEEVE AND THE PENETRATION UNLESS SPECIFICALLY REQUIRED BY THE MANUFACTURERS INSTALLATION INSTRUCTIONS.

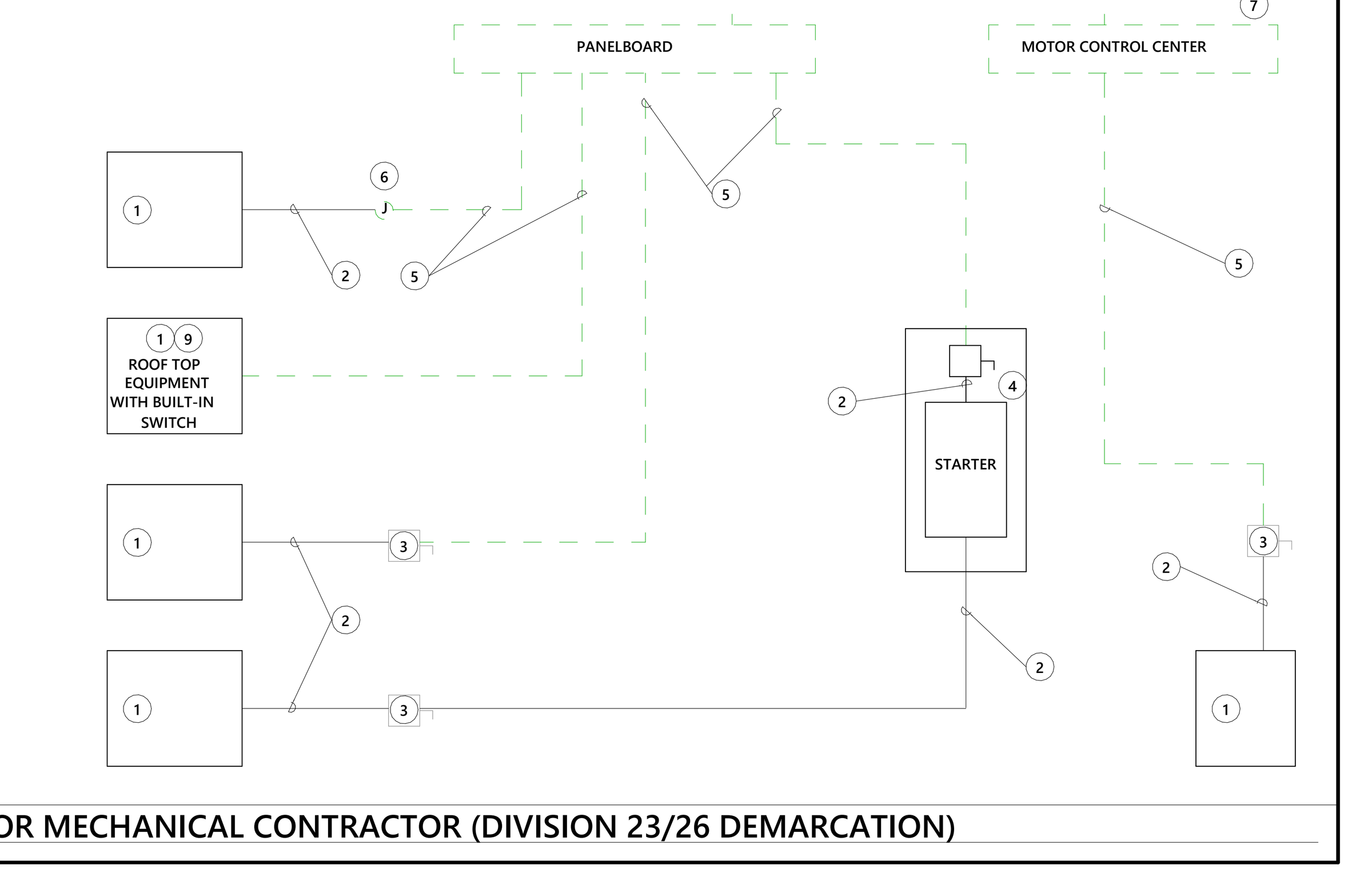
7 LOW PRESSURE FIRE DAMPER W/ GRILLE
NO SCALE

NOTES:
1. PROVIDE PIPE SUPPORTS AT 6'-0" ON CENTER, OR AS REQUIRED TO PREVENT SAGGING.
2. PROVIDE ADDITIONAL SUPPORTS AT EQUIPMENT TO PREVENT THE WEIGHT OF PIPING BEING PLACED ON THE EQUIPMENT.



8 ROOF PIPING SUPPORT DETAIL
NO SCALE

NOTES:
1. EQUIPMENT OF TRADES OTHER THAN ELECTRICAL.
2. CONDUIT AND WIRING BY MECHANICAL, PLUMBING CONTRACTOR OR OTHER TRADES.
3. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC, IT SHALL BE PROVIDED AND INSTALLED BY THE EQUIPMENT CONTRACTOR.
4. A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER LOCATE ADJACENT TO EQUIPMENT.
5. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
6. JUNCTION BOX MAY BE SHOWN ON ELECTRICAL PLANS FOR SOME EQUIPMENT. IF NO STARTER OR DISCONNECT IS SUPPLIED, A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX. LOAD SIDE WIRING WILL BE PROVIDED BY MECHANICAL CONTRACTOR OR OTHER TRADES.
7. PROJECTS UTILIZING AN MCC. THE STARTER, CB, OR VFD IN THE MCC ARE PROVIDED BY THE ELECTRICAL CONTRACTOR.
8. IN ALL CASES THE EQUIPMENT CONTRACTOR SHALL MAKE FINAL CONNECTIONS STARTUP, AND TEST EQUIPMENT.
9. IF THE ROOF TOP EQUIPMENT IS NOT PROVIDED WITH BUILT IN SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH.



9 ELECTRICAL REQUIREMENTS FOR MECHANICAL CONTRACTOR (DIVISION 23/26 DEMARCATION)
NO SCALE

Opt # 23-0128

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North Carolina License Number C-0914

3/3/25

RICHMOND COMMUNITY COLLEGE HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

MECHANICAL DETAILS

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
M502

2018 NORTH CAROLINA ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - ELECTRICAL SUMMARY

C401 METHOD OF COMPLIANCE

■ 2018 NCECC CHAPTER 4 ☐ NC SPECIFIC COMCHECK PROVIDED
☐ N/A BASED ON PROJECT SCOPE ☐ ASHRAE 90.1-2013

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

☐ C406.2 EFFICIENT MECH EQUIPMENT ☐ C406.5 ON-SITE RENEWABLE ENERGY
■ C406.3 REDUCED LTG DENSITY ☐ C406.6 DEDICATED OA SYSTEM
☐ C406.4 ENHANCED DIGITAL LTG CNTLS ☐ C406.7 HI-EFF SERVICE WTR HTG
☐ NOT APPLICABLE BASED ON PROJECT SCOPE ☐ C406.7.1 WTR HTG LOAD FRACTION

C405.2 - LIGHTING CONTROLS (MANDATORY REQUIREMENTS):

■ LIGHTING SYSTEMS ARE PROVIDED WITH CONTROLS AS REQUIRED PER SECTION C405.2, EXCEPT WHERE EXEMPT.
☐ NOT APPLICABLE

C405.3 - EXIT SIGNS (MANDATORY REQUIREMENTS):

■ INTERNALLY ILLUMINATED EXIT SIGNS DO NOT EXCEED 5 WATTS PER SIDE.
☐ NOT APPLICABLE

C405.4 - INTERIOR LIGHTING POWER REQUIREMENTS (PRESCRIPTIVE) (NON-EXEMPT):

☐ NOT APPLICABLE PER 2018 NCECC C503.1, EXCEPTION 2.G.

C405.4.1 - TOTAL CONNECTED INTERIOR LIGHTING POWER:

6368.70 WATTS SPECIFIED
15.06 % REDUCTION OF SPECIFIED VS. ALLOWED (APPLICABLE IF C406.1.2 IS SELECTED)

C405.4.2 - TOTAL ALLOWABLE INTERIOR LIGHTING POWER:

METHOD OF COMPLIANCE:
■ BUILDING AREA METHOD ☐ SPACE-BY-SPACE METHOD

7497.83 WATTS ALLOWED

C405.5.1 - EXTERIOR BUILDING LIGHTING POWER (NON-EXEMPT):

☐ NOT APPLICABLE

TOTAL CONNECTED EXTERIOR LIGHTING POWER:

368 WATTS SPECIFIED

TOTAL ALLOWABLE EXTERIOR LIGHTING POWER:

1418.28 WATTS ALLOWED

C405.6 - ELECTRICAL ENERGY CONSUMPTION (DWELLING UNITS):

☐ SEPARATE ELECTRICAL METERING HAS BEEN PROVIDED FOR EACH DWELLING UNIT IN GROUP R-2 BUILDINGS.
■ NOT APPLICABLE

C405.7 - ELECTRICAL TRANSFORMERS (MANDATORY REQUIREMENTS):

■ ELECTRICAL TRANSFORMERS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.7, EXCEPT WHERE EXEMPT.
☐ NOT APPLICABLE

C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS):

■ ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.
☐ NOT APPLICABLE

C408 - SYSTEM COMMISSIONING:

☐ PROJECT AREA IS LESS THAN 10,000 SQUARE FEET AND IS EXEMPT FROM THE SYSTEM COMMISSIONING REQUIREMENTS OF SECTION C408.
■ PROJECT AREA IS GREATER THAN 10,000 SQUARE FEET AND REQUIRES SYSTEM COMMISSIONING PER SECTION C408.

SYMBOL SCHEDULE POWER

SYMBOL	DESCRIPTION
	WIRING SYSTEM CONCEALED IN WALL OR CEILING. WHEN SHOWN, CROSS LINES INDICATE NUMBER OF WIRES. (GROUND WIRES ARE NOT SHOWN)
	WIRING SYSTEM CONCEALED IN OR UNDER SLAB OR UNDERGROUND.
	WIRING SYSTEM EXPOSED.
	CONDUIT TURNED DOWN TO FLOOR BELOW.
	CONDUIT TURNED UP TO FLOOR ABOVE.
	BRANCH CIRCUIT HOMERUN TO PANEL.

SYMBOL SCHEDULE POWER LEGEND

SYMBOL	DESCRIPTION
	JUNCTION BOX WITH CONNECTION TO EQUIPMENT SERVED. 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING.
	CEILING MOUNT JUNCTION BOX WITH CONNECTION TO EQUIPMENT SERVED
	FLOOR MOUNT JUNCTION BOX WITH CONNECTION TO EQUIPMENT SERVED
	208/120V THREE PHASE PANELBOARD. SEE SCHEDULE FOR MOUNTING. TOP OF PANEL AT 6'-6" AFF.
	480Y/277V THREE PHASE PANELBOARD. SEE SCHEDULE FOR MOUNTING. TOP OF PANEL AT 6'-6" AFF.
	480-208Y/120V TRANSFORMER. SEE RISER FOR SIZE. PROVIDE 4" THICK HOUSEKEEPING PAD TO EXTEND 3" ON SIDES, FRONT WITH CHAMFER EDGE AND OSHA COMPLIANT, SAFETY YELLOW, EPOXY PAINT SUITABLE FOR CONCRETE.
SPD	SURGE PROTECTION DEVICE (SPD); SEE DETAIL.
	SPECIAL OUTLET. SEE PLANS FOR MOUNTING HEIGHT.
	FUSED HEAVY DUTY DISCONNECT SWITCH. NUMERALS INDICATE SWITCH RATING. NEMA 1 ENCLOSURE, UNLESS OTHERWISE NOTED. UNSHADED INDICATES NON-FUSED.
0.3 hp XX-1	CONNECTION TO MOTOR. STARTER PROVIDED BY OTHERS UNLESS OTHERWISE NOTED. NUMBER INDICATES HORSEPOWER.
	FRACTIONAL HORSEPOWER MANUAL MOTOR STARTER, WITH OVERLOAD PROTECTION
	HANDHOLE
	SP INDICATES SHORE POWER DROP - SPECIAL RECEPTACLE. ATTACHED SO CORD, WITH STRAIN RELIEF, TO STRUCTURAL MEMBER AT CEILING STRUCTURE. PROVIDE SPECIAL RECEPTACLE NOTED ON PLANS. COORDINATE HEIGHT OF RECEPTACLE WITH OWNER AND EQUIPMENT PRIOR TO ROUGH-IN. SEE DETAIL #9/E604 FOR ADDITIONAL INFORMATION.
	SWITCH - START/STOP PUSH BUTTON - WALL

ELECTRICAL FIXTURES LEGEND - COMMERCIAL

SYMBOL	DESCRIPTION
	WEATHER PROOF SIMPLEX RECEPTACLE, NEMA 5-20R WITH IN-USE COVER.
	DUPLEX RECEPTACLE, 20 AMP, 120 VOLT COOPER 5362 OR EQUAL.
	GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX. ALL RECEPTACLES INSTALLED OUTSIDE, WITHIN 6' OF A SINK OR IN A KITCHEN SHALL BE GFCI.
	GROUND FAULT DUPLEX RECEPTACLE, NEMA 5-20R MOUNTED ABOVE COUNTER BACKSPLASH OR AT HEIGHT NOTED.
	ISOLATED GROUND RECEPTACLE. NEMA 5-20R DUPLEX.
WRD	WEATHERPROOF GROUND FAULT RECEPTACLE. NEMA 5-20R DUPLEX, CORROSION RESISTANT, WITH IN-USE COVER.
	QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX RECEPTACLES, OTHERWISE SAME AS DUPLEX RECEPTACLE ABOVE.
WRC	QUAD RECEPTACLE, TWO NEMA 5-20R FOR ELECTRIC WATER COOLER TO BE SUPPLIED BY GROUND FAULT BREAKER. COORDINATE LOCATION WITH PLUMBING CONTRACTOR.
	GROUND FAULT QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX RECEPTACLES ABOVE COUNTER.

NFPA FIRE ALARM LEGEND

SYMBOL	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL
FAA	FIRE ALARM ANNUNCIATOR
BDA	BI-DIRECTIONAL AMPLIFIER SYSTEM
	GAS DETECTOR (TYPE DENOTED)
	HEAT DETECTOR/SENSOR. X=TYPE
	PULLSTATION/FIRE ALARM
	SMOKE DETECTOR/SENSOR (DEFAULT PHOTOELECTRIC TYPE)
	FIRE ALARM REMOTE INDICATOR
	FIRE ALARM CEILING MOUNT INDICATOR
DD	RECTANGULAR DUCT SMOKE DAMPER. FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR, CONNECTED TO FIRE ALARM SYSTEM BY ELECTRICAL CONTRACTOR.
15cd	FIRE ALARM STROBE (CANDELAS), WHITE FINISH
15cd	ADA COMPLIANT WALL MOUNTED FIRE ALARM HORN WITH STROBE LIGHT, 15CD UNLESS OTHERWISE NOTED. WHITE FINISH.**
15cd	FIRE ALARM STROBE (CANDELAS), WHITE FINISH
15cd	FIRE ALARM HORN W/STROBE (CANDELAS), WHITE FINISH
	SMOKE DETECTOR/SENSOR - MOUNTED IN DUCT. APC #HS-100-P OR EQUAL.

**Note: AUDIBLE DEVICES WITHIN SLEEPING ROOMS SHALL BE SUBJECT TO LOW FREQUENCY REQUIREMENTS. A SQUARE WAVE 520HZ TONE COMPATIBLE WITH NFPA 72 18.4.5.3. COORDINATE WITH LOCAL CODES AND REQUIREMENTS.

TELECOM LEGEND - ELECTRICAL

SYMBOL	DESCRIPTION
	PLYWOOD TELEPHONE BACKBOARD. SIZE AS INDICATED ON RISER.
	TELEPHONE OUTLET ABOVE COUNTER OR HEIGHT SPECIFIED. MINIMUM 1" CONDUIT TO ABOVE NEAREST ACCESSIBLE CEILING FOR J-HOOK SYSTEM OR TO LOCAL CABLE TRAY (WITHIN 6') AS APPLICABLE WITH PULL STRING. 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING. DATA/TELEPHONE DROPS, NUMBER INDICATES NUMBER OF JACKS/CABLING IN FACEPLATE. HEIGHT AS INDICATED.
#	DATA OUTLET. MINIMUM 1 1/4" CONDUIT TO ABOVE NEAREST ACCESSIBLE CEILING FOR J-HOOK SYSTEM OR TO LOCAL CABLE TRAY (WITHIN 6') AS APPLICABLE WITH PULL STRING. 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING. PATHWAY ONLY.
MAP	STRUCTURE MOUNTED JUNCTION BOX FOR WIRELESS ACCESS POINT IN OPEN CEILING APPLICATIONS. 4" SQUARE BOX WITH A TWO-GANG OPENING. STUB 1" EC FROM BOX TO J-HOOKS OR CABLE TRAY ABOVE ACCESSIBLE CEILING.
TV	SEE TV DETAIL FOR TYPE AND REQUIREMENTS. MINIMUM 1 1/4" CONDUIT FOR CABLING AND 3/4" CONDUIT FOR POWER. PROVIDE PULL STRING FOR LOW VOLTAGE CABLING TO ACCESSIBLE CEILING.
TMB	TELECOMMUNICATIONS PRIMARY BUS BAR
	DATA RACK, WALL MOUNTED

SECURITY DEVICES SYMBOL LEGEND - ELECTRICAL

SYMBOL	DESCRIPTION
	CEILING MOUNTED SECURITY CAMERA LOCATION. CAMERA PROVIDED AND INSTALLED BY OTHERS. PROVIDED JUNCTION BOX AS REQUIRED BY OTHERS.
	CAMERA. WALL MOUNTED. PROVIDE ONE (1) CATEGORY 6A CABLE. REFER TO ELECTRICAL DRAWINGS FOR JUNCTION BOX AND CONDUIT REQUIREMENTS.

SPECIAL SYSTEMS LEGEND

SYMBOL	DESCRIPTION
D	DISPLAY. PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT. REFER TO ELECTRICAL DRAWINGS FOR RECESSED WALL BOX AND CONDUIT REQUIREMENTS.

EM./LS LIGHTING FIXTURE SYMBOLS AND DEVICES

SYMBOL	DESCRIPTION
	● LED FIXTURE WITH EMERGENCY BATTERY BALLAST OR DRIVER ON LIFE SAFETY BRANCH. ■ PROVIDE 1100 LUMEN INVERTER RATED FOR 90 MINUTE OPERATION. SEE FIXTURE SCHEDULE FOR FIXTURE TYPE, EMERGENCY DEVICE SHALL SUPPLEMENT FIXTURE.
1	SWITCHING DEVICE INDICATOR;INDICATES SWITCH AND ASSOCIATED FIXTURES CONTROLLED BY DEVICE.

LIGHTING FIXTURES SYMBOLS AND DEVICES...

SYMBOL	DESCRIPTION
	LED LIGHTING FIXTURE. SEE FIXTURE SCHEDULE. SUSPEND FOUR CORNERS WITH WIRE TO STRUCTURE. DO NOT ALLOW GRID ALONE TO SUPPORT FIXTURE.
	LED STRIP LIGHT FIXTURE
	RECESSED LED OR H.I.D. LIGHTING FIXTURE.
	RECESSED LINEAR LIGHT (TYPE DENOTED IN LIGHTING SCHEDULE)
	SUSPENDED OR PENDANT LIGHT (TYPE DENOTED)
	EXIT LIGHT WITH ARROWS AND NUMBERS OF FACES AS INDICATED ON PLANS. 90 MIN BATTERY BACKUP. SEE LIGHTING FIXTURE SCHEDULE.
	EXIT LIGHT WITH ARROWS AND NUMBERS OF FACES AS INDICATED ON PLANS. 90 MIN BATTERY BACKUP. SEE LIGHTING FIXTURE SCHEDULE.
S	SINGLE POLE SWITCH, 20 AMP, 120/277 VOLT, COOPER AH 1221, OR EQUAL BY HUBBELL, LEVITON AND PASS & SEYMOUR.
S_3	THREE WAY SWITCH, 20 AMP, 120/277 VOLT, COOPER 1223, THREE WAY SWITCH, 20 AMP, 120/277 VOLT, COOPER 1223, OR EQUAL BY HUBBELL, LEVITON AND PASS & SEYMOUR.
S_4	FOUR WAY SWITCH, 20 AMP, 120/277 VOLT, COOPER 1224 OR EQUAL.
S_K	KEY OPERATED SWITCH
S_D	0-10V DIMMER SWITCH. SEE DETAIL "CLASSROOM SWITCH CONTROL - DIMMING" FOR TYPE AND TYPICAL APPLICATION. 3WAY "3D" APPLICATION IS BASED ON ON/ON LOW VOLTAGE SWITCH SWX-801 OR EQUAL.
S_{DLV}	SWITCH, DIMMING, LOW VOLTAGE MOUNTED IN FLUSH JUNCTION BOX.
O_M	CEILING MOUNTED OCCUPANCY SENSOR, DUAL TECHNOLOGY. 360 DEGREE COVERAGE, 2,000 SQ FT COVERAGE LARGE MOTION, 400 SQ FT SMALL MOTION. NON CATEGORY CABLE CONNECTORS. LOW VOLTAGE DETECTOR, PROVIDE WITH POWER PACK FOR EACH SWITCH LEG. SENSOR SWITCH, WATT STOPPER, LEVITION, EATON, SENSORWORX OR EQUAL.
O_C	CEILING MOUNTED OCCUPANCY SENSOR, ULTRASONIC WATT STOPPER #WT-2255 OR EQUAL.
S_{OC}	WALL MOUNTED OCCUPANCY SENSOR AND SWITCH. INFRARED TECHNOLOGY WITH NEUTRAL, 120/277V RATED. WATT STOPPER #WS-250, OR EQUAL BY SENSOR SWITCH, AND LEVITON.
S_{OCD}	WALL MOUNTED OCCUPANCY SENSOR AND SWITCH WITH 0-10V DIMMING. INFRARED TECHNOLOGY, WATT STOPPER #PW-311, SENSOR SWITCH, COOPER CONTROLS OR EQUAL. SWITCH SHALL BE INSTALLED IN SINGLE GANG BOX. 120V RATED.
O_D	CEILING MOUNTED OCCUPANCY SENSOR POWER PACK. SENSOR SWITCH PP-20, WATT STOPPER #BZ-100, COOPER SP-20, OR EQUAL.
O_D	CEILING MOUNTED OCCUPANCY SENSOR POWER PACK WITH DIMMER. SENSOR SWITCH PP-20, WATT STOPPER #BZ-100, COOPER SP-20, OR EQUAL.
W_{DL}	WALL MOUNT OCCUPANCY SENSOR, DUAL TECHNOLOGY SENSOR SWITCH WV-PDT, WATT STOPPER #DT-200, LEVITON, GREENGATE OR EQUAL. CONICAL PATTERN, MOUNT AS CLOSE TO CORNER OF ROOM AS POSSIBLE. MOUNT 10' AFF OR 6" BELOW CEILING (IF LOWER THAN 10'.)

FLR. BOX OUTLETS-REC. FLUSH MOUNT SYMBOL...

SYMBOL	DESCRIPTION
	TWO GANG FLUSH MOUNTED FLOOR BOX WITH ACCESSIBLE COVER FOR POWER. PROVIDE TWO NEMA 5-20R DUPLEX RECEPTACLES. EQUAL TO WIREMOLD RFB2-OG-FPBTC. ARCHITECT TO SELECT FINISH.

Note: CONTRACTOR SHALL VERIFY WITH ARCHITECT THE FLOOR FINISH PRIOR TO ORDERING MATERIAL. PROVIDE ALL NECESSARY SHIMS, TRIM PLATES, ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.

ELECTRICAL SHEET INDEX

PANEL DESIGNATION SYSTEM

L3N-101

①②③ ④⑤

① L = LIGHTING
P = POWER
D = DISTRIBUTION
S = SWITCHBOARD
RP = RELAY PANEL

② 1 = 120/240V 1Ø
2 = 240V 3Ø
3 = 120/208V 3Ø
4 = 277/480V 3Ø
5 = -SPECIAL-

③ N = NORMAL POWER SOURCE
E = EMERGENCY POWER SOURCE

④ B = BASEMENT FLOOR
G = GROUND FLOOR
1 = FIRST FLOOR
2 = SECOND FLOOR
ETC.

⑤ 01 = PANELBOARD #1
02 = PANELBOARD #2
03 = PANELBOARD #3
ETC.

ELECTRICAL ABBREVIATIONS LIST

1P	1 POLE (2P, 3P, 4P, ETC.)	DCP	DOMESTIC WATER CIRCULATING PUMP	HT	HEIGHT	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
A	AMPERE	DEPT	DEPARTMENT	HTG	HEATING	NFDS	NON-FUSED SAFETY DISCONNECT SWITCH
AC	ABOVE COUNTER OR AIR CONDITIONER	DET	DETAIL	HTR	HEATER	NIC	NOT IN CONTRACT
ACLG	ABOVE CEILING	DIA	DIAMETER	HV	HIGH VOLTAGE	NL	NIGHT LIGHT
ADO	AUTOMATIC DOOR OPENER	DISC	DISCONNECT	HVAC	HEATING, VENTILATING AND AIR CONDITIONING	N.O.	NORMALLY OPEN
AF	AMP FRAME	DIST	DISTRIBUTION	HWP	HYDRONIC WATER PUMP	NPF	NORMAL POWER FACTOR
AFF	ABOVE FINISHED FLOOR	DN	DOWN			NTS	NOT TO SCALE
AFG	ABOVE FINISHED GRADE	DPR	DAMPER	IC	INTERRUPTING CAPACITY		
AFI	ARC FAULT CIRCUIT INTERRUPTER	DS	SAFETY DISCONNECT SWITCH	IG	ISOLATED GROUND	OH	OVERHEAD
		DT	DOUBLE THROW	IMC	INTERMEDIATE METAL CONDUIT	OL	OVERLOADS
AHU	AIR HANDLING UNIT	DWG	DRAWING	INCAND	INCANDESCENT		
AL	ALUMINUM			IR	INFRARED	PA	PUBLIC ADDRESS
ALT	ALTERNATE	EC	ELECTRICAL CONTRACTOR	I/W	INTERLOCK WITH	PB	PULL BOX OR PUSHBUTTON
AMP	AMPERE	ELEC	ELECTRIC, ELECTRICAL			PE	PNEUMATIC ELECTRIC
AMPL	AMPLIFIER	ELEV	ELEVATOR	J-BOX	JUNCTION BOX	PED	PEDESTAL
ANNUN	ANNUNCIATOR	EM	EMERGENCY			PF	POWER FACTOR
APPROX	APPROXIMATELY	EMS	ENERGY MANAGEMENT SYSTEM	KV	KILOVOLT	PH	PHASE
AQ-STAT	AQUASTAT	EMT	ELECTRICAL METALLIC TUBING	KVA	KILOVOLT-AMPERE	PIV	POST INDICATING VALVE
ARCH	ARCHITECT, ARCHITECTURAL	EP	ELECTRIC PNEUMATIC	KVAR	KILOVOLT-AMPERE REACTIVE	PNL	PANEL
AS	AMP SWITCH	EQUIP	EQUIPMENT	KW	KILOWATT	PP	POWER POLE
AT	AMP TRIP	EWC	ELECTRIC WATER COOLER	KWH	KILOWATT HOUR	PR	PAIR
ATS	AUTOMATIC TRANSFER SWITCH	EX	EXISTING			PRI	PRIMARY
AUTO	AUTOMATIC	EXH	EXHAUST	LOC	LOCATE OR LOCATION	PROJ	PROJECTION
AUX	AUXILIARY	EXP	EXPLOSION PROOF	LT	LIGHT	PRV	POWER ROOF VENTILATOR
AV	AUDIO VISUAL			LTG	LIGHTING	PT	POTENTIAL TRANSFORMER
AWG	AMERICAN WIRE GAUGE	FA	FIRE ALARM	LTNG	LIGHTNING	PVC	POLYVINYL CHLORIDE (CONDUIT)
		FABP	FIRE ALARM BOOSTER POWER SUPPLY PANEL	LV	LOW VOLTAGE	PWR	POWER
BATT	BATTERY	FACP	FIRE ALARM CONTROL PANEL	MAX	MAXIMUM		
BD	BOARD	FCU	FAN COIL UNIT	MAG.S	MAGNETIC STARTER		
BLDG	BUILDING	FIXT	FIXTURE	M/C	MOMENTARY CONTACT		
BMS	BUILDING MANAGEMENT SYSTEM	FLR	FLOOR	MC	MECHANICAL CONTRACTOR	QUAN	QUANTITY
		FLUOR	FLUORESCENT	MCB	MAIN CIRCUIT BREAKER		
C	CONDUIT	FU	FUSE	MCC	MOTOR CONTROL CENTER	RCPT	RECEPTACLE
CAB	CABINET	FUDS	FUSED SAFETY DISCONNECT SWITCH	MDC	MAIN DISTRIBUTION CENTER	REQD	REQUIRED
CAT	CATALOG			MDP	MAIN DISTRIBUTION PANEL	RM	ROOM
CATV	CABLE TELEVISION	GA	GAUGE	MFR	MANUFACTURER	RSC	RIGID STEEL CONDUIT
CB	CIRCUIT BREAKER	GAL	GALLON	MFS	MAIN FUSED DISCONNECT SWITCH	RTU	ROOF TOP UNIT
CCTV	CLOSED CIRCUIT TELEVISION	GALV	GALVANIZED	MH	MANHOLE	SC	SURFACE CONDUIT
CKT	CIRCUIT	GC	GENERAL CONTRACTOR	MIC	MICROPHONE	SEC	SECONDARY
CLG	CEILING	GEN	GENERATOR	MIN	MINIMUM	SHT	SHEET
COMB	COMBINATION	GFI	GROUND FAULT CIRCUIT INTERRUPTER	MISC	MISCELLANEOUS	SIM	SIMILAR
CMPR	COMPRESSOR	GFP	GROUND FAULT PROTECTOR	MLO	MAIN LUGS ONLY	S/N	SOLID NEUTRAL
CONN	CONNECTION	GND	GROUND	MMS	MANUAL MOTOR STARTER	SPEC	SPECIFICATION
CONST	CONSTRUCTION	GRS	GALVANIZED RIGID STEEL (CONDUIT)	MOA	MULTIOUTLET ASSEMBLY	SPKR	SPEAKER
CONT	CONTINUATION OR CONTINUOUS	GYP BD	GYPSUM BOARD	MSP	MOTOR STARTER PANELBOARD	SP	SPARE
				MSBD	MAIN SWITCHBOARD	SR	SURFACE RACEWAY
CONTR	CONTRACTOR	HOA	HANDS-OFF-AUTOMATIC SWITCH	MT	MOUNT	SS	STAINLESS STEEL
CONV	CONVECTOR	HORIZ	HORIZONTAL	MT.C	EMPTY CONDUIT	SSW	SELECTOR SWITCH
CP	CIRCULATING PUMP	HP	HORSEPOWER	MTS	MANUAL TRANSFER SWITCH	S/S	STOP/START PUSHBUTTONS
CRT	CATHODE-RAY TUBE	HPF	HIGH POWER FACTOR	MTR	MOTOR, MOTORIZED	STA	STATION
CT	CURRENT TRANSFORMER					STD	STANDARD
CTR	CENTER			N.C.	NORMALLY CLOSED	SURF	SURFACE MOUNTED
CU	COPPER			NEC	NATIONAL ELECTRICAL CODE	SW	SWITCH
						SWBD	SWITCHBOARD
						SYM	SYMMETRICAL
						SYS	SYSTEM
						TEL	TELEPHONE
						TEL/DATA	TELEPHONE/DATA
						TERM	TERMINAL
						TL	TWIST LOCK
						TR	TAMPER RESISTANT
						T-STAT	THERMOSTAT
						TTC	TELEPHONE TERMINAL CABINET
						TV	TELEVISION
						TVTC	TELEVISION TERMINAL CABINET
						TYP	TYPICAL
						UC	UNDER COUNTER
						UE	UNDERGROUND ELECTRICAL
						UG	UNDERGROUND
						UH	UNIT HEATER
						UT	UNDERGROUND TELEPHONE
						UTIL	UTILITY
						UV	UNIT VENTILATOR OR ULTRAVIOLET
						V	VOLT
						VA	VOLT-AMPERES
						VDT	VIDEO DISPLAY TERMINAL
						VERT	VERTICAL
						VFD	VARIABLE FREQUENCY DRIVE
						VOL	VOLUME
						W	WATT
						W/	WITH
						WG	WIRE GUARD
						WH	WATER HEATER
						W/O	WITHOUT
						WP	WEATHERPROOF
						XFMR	TRANSFORMER
						XFR	TRANSFER
						∠	ANGLE
						@	AT
						△	DELTA
						'	FEET
						"	INCHES
						#	NUMBER
						Ø	PHASE
						C	CENTER LINE
						P	PLATE

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3/3/25

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BID DOCUMENTS

ELECTRICAL LEGEND AND NOTES

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS

NO: DATE: DESCRIPTION:

SHEET NUMBER

E001

1. GENERAL:
   A. THE WORK COVERED BY THESE SPECIFICATIONS CONSISTS OF FURNISHING ALL LABOR, EQUIPMENT, MATERIALS, AND SUPPLIES AS NECESSARY FOR THE COMPLETE AND SATISFACTORY OPERATING ELECTRICAL SYSTEMS AS SHOWN ON THE PLANS.
   B. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE NATIONAL ELECTRICAL CODE, NFPA, STATE BUILDING CODE, AND ANY OTHER LOCAL REQUIREMENTS THAT MAY APPLY.
   C. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL ELECTRICAL PERMITS AND INSPECTION FEES.
   D. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SHALL BE LISTED BY THE UNDERWRITER'S LABORATORIES, INC. OR BY A STATE APPROVED THIRD PARTY TESTING AGENCY FOR THE USE INTENDED WHERE A STANDARD FOR SUCH MATERIALS AND USE EXISTS. ALL ITEMS OF THE SAME TYPE AND RATING SHALL BE IDENTICAL AND OF THE SAME MANUFACTURER.
   E. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CATALOG DATA IN ELECTRONIC FORMAT (PDF) FOR ALL ELECTRICAL ITEMS IN THE SCOPE OF WORK, INCLUDING, BUT NOT LIMITED TO, RACEWAYS, BOXES, FITTINGS, CONDUCTORS, LUMINAIRES, LAMPS, BALLASTS, WIRING DEVICES, SAFETY SWITCHES, DISCONNECTS, TRANSFORMERS, PANELBOARDS, SWITCHBOARDS, SWITCHGEARS, MOTOR CONTROL CENTERS (MCC), BUSWAYS, GENERATORS, AUTOMATIC TRANSFER SWITCHES (ATS), UNINTERRUPTIBLE POWER SUPPLY (UPS), POWER DISTRIBUTION UNITS (PDU), FLOOR/REMOTE DISTRIBUTION CABINETS (FDC/RDC), STATIC TRANSFER SWITCHES (STS), FIRE ALARM, TELECOMMUNICATIONS, ETC. FOR APPROVAL AS APPLICABLE FOR THE PROJECT. ONE COMPLETE SET OF APPROVED SUBMITTALS SHALL BE MAINTAINED AT THE JOB SITE.
   F. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH THE BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, CONDUIT, WIRING, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, METHODS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COSTS ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED AFTER BIDS HAVE BEEN ACCEPTED AND ALL COSTS WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. CREDITS SHALL BE GIVEN TO THE OWNER WHERE SUCH EQUIPMENT AND METHODS RESULT IN LESS EXPENSE TO THE CONTRACTOR.
   G. ONE COMPLETE SET OF THE LATEST CONSTRUCTION PLANS OF ALL TRADES SHALL BE MAINTAINED AT THE JOB SITE. IN ADDITION, ALL ADDENDUMS, BULLETINS, AND/OR SKETCHES SHALL BE INCORPORATED INTO THE ON-SITE CONSTRUCTION PLANS AS THE JOB PROGRESSES.
   H. COMPLETELY ADEQUATE HOUSING SHALL BE PROVIDED FOR ALL MATERIALS STORED ON JOB SITE. ONLY CONDUIT MAY BE STORED OUTSIDE, BUT NOT IN CONTACT WITH THE GROUND.
   I. THE CONDUIT AND NEUTRAL SYSTEM SHALL BE GROUNDED AT THE MAIN SERVICE EQUIPMENT. GROUNDING ELECTRODE SYSTEM SHALL BE INSTALLED PER NEC 250.
   J. PROVIDE AN INTERSYSTEM BONDING TERMINATION DEVICE AT THE MAIN ELECTRICAL SERVICE PER NEC 250.94.
   K. WIRING SHALL BE TESTED FOR CONTINUITY AND GROUNDS BEFORE BEING ENERGIZED. FAULTY WIRING SHALL BE REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER.
   L. PROVIDE ALL CUTTING AND PATCHING FOR INSTALLATION OF WORK AND REPAIR ANY DAMAGE DONE.
   M. THE ELECTRICAL CONTRACTOR SHALL CONNECT ALL EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS (UNLESS OTHERWISE NOTED), EXCEPT FOR CONTROL WIRING FOR EQUIPMENT NOT PROVIDED BY THE ELECTRICAL CONTRACTOR. CONTROL WIRING FOR SUCH EQUIPMENT SHALL BE PROVIDED BY THE RESPECTIVE DISCIPLINE.
   N. ALL ELECTRICAL JUNCTION BOXES, SWITCHGEAR, CABLING, VOICE/DATA OUTLETS, LOW VOLTAGE CABINETS, EMERGENCY RECEPTACLES, ETC. SHALL BE LABELED ACCORDING TO PANEL/RACK AND CIRCUIT NUMBER.
   O. UPON COMPLETION OF WORK, CONTRACTOR SHALL PRESENT ENGINEER WITH CERTIFICATE OF APPROVAL FROM LOCAL INSPECTOR AND/OR AUTHORITY HAVING JURISDICTION BEFORE WORK WILL BE APPROVED FOR FINAL PAYMENT.
   P. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS FOR A PERIOD OF ONE YEAR EFFECTIVE THE DATE THE PROJECT IS ACCEPTED BY THE OWNER. ANY IMPERFECT MATERIALS OR WORKMANSHIP SHALL BE REPLACED WITHOUT ADDED COST TO THE PROJECT.
   Q. IT SHALL NOT BE THE INTENT OF ISSUED PLANS AND/OR SPECIFICATIONS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION. THE ELECTRICAL CONTRACTOR IS EXPECTED TO FURNISH AND INSTALL ALL NECESSARY ITEMS FOR A COMPLETE AND OPERATING SYSTEM.
   R. THE WORD "PROVIDE" MEANS THAT THIS CONTRACTOR SHALL FURNISH, FABRICATE, ERECT, CONNECT, AND COMPLETELY INSTALL SYSTEMS IN PROPER OPERATING CONDITION. ALL LABOR, PRODUCT OPTIONS, ACCESSORIES AND INCIDENTAL MATERIALS REQUIRED SHALL BE INCLUDED AS PART OF THIS WORK TO COMPLETE THE INSTALLATION.
   S. THE WORD "CONNECT" MEANS THAT THIS CONTRACTOR SHALL PROVIDE (SEE DEFINITION ABOVE) ALL DISCONNECTING MEANS, OVERCURRENT PROTECTION AND WIRING REQUIRED TO PLACE THE EQUIPMENT AND SYSTEMS IN PROPER OPERATING CONDITION AND TO COMPLY WITH CODE REQUIREMENTS.
   T. CONTRACTOR SHALL COORDINATE THE ROUGH-IN OF ALL OUTLET LOCATIONS WITH ARCHITECTURAL FLOOR PLANS, ELEVATIONS, AND MILLWORK SHOP DRAWINGS PRIOR TO ROUGH-IN.
   U. ELECTRICAL CONTRACTOR SHALL NOT SCALE PLANS. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS AND ELEVATIONS FOR EXACT LOCATIONS OF ALL EQUIPMENT, UNLESS OTHERWISE NOTED.
   V. CONTRACTOR SHALL TEST ALL "LIFE SAFETY" EQUIPMENT AND SYSTEMS FOR PROPER FUNCTION AND OPERATION. UPON SUCCESSFUL COMPLETION OF TESTS, CONFIRMATION SHALL BE SENT TO THE ENGINEER OF RECORD IN THE FORM OF A LETTER STATING THE TESTS PERFORMED, THE RESULTS, AND THE DATE TESTS WERE SUCCESSFULLY COMPLETE. "LIFE SAFETY" EQUIPMENT AND SYSTEMS CONSIST OF THOSE AS SPECIFIED IN THE STATE BUILDING CODE, THE NATIONAL ELECTRICAL CODE, NFPA 101, AND ANY OTHER LOCAL REQUIREMENTS THAT MAY APPLY.
   W. IF DURING THE COURSE OF WORK, THE CONTRACTOR DISCOVERS A PROBLEM WITH THE PERFORMANCE OF THE INSTALLATION RELATIVE TO THE PLANS AND SPECIFICATIONS, THE NEC, OR OTHER CODES OR REQUIREMENTS, THE CONTRACTOR SHALL IMMEDIATELY BRING THE PROBLEM TO THE ATTENTION OF THE ARCHITECT AND/OR ENGINEER FOR RESOLUTION PRIOR TO THE EXECUTION OF THE WORK.
   X. WHERE THERE ARE CONFLICTS BETWEEN THE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL BRING THE ISSUE TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION PRIOR TO THE EXECUTION OF THE WORK OR ORDERING ANY MATERIALS. NO ADDITIONAL COSTS SHALL BE WARRANTED WITHOUT A CHANGE TO THE PROJECT SCOPE.
   Y. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING AND PROVIDING TEMPORARY POWER AND LIGHTING FOR ALL TRADES. AT NO TIME SHALL EXISTING BUILDING POWER SYSTEMS BE UTILIZED WITHOUT WRITTEN PERMISSION FROM THE OWNER.
   Z. COORDINATE LOCATION AND REQUIREMENTS FOR ELECTRICAL SERVICE WITH THE POWER COMPANY. WHERE MORE THAN ONE SERVICE IS SUPPLIED TO A BUILDING, PROVIDE IDENTIFICATION AT EACH SERVICE PER NEC 230-2(E).
   AA. COORDINATE LOCATION AND REQUIREMENTS FOR TELEPHONE SERVICE WITH THE TELEPHONE COMPANY.

2. RACEWAY:
   A. CONDUIT SHALL BE MANUFACTURED BY ALLIED, WHEATLAND, REPUBLIC CONDUIT, WESTERN TUBE, OR APPROVED EQUIVALENT.
   B. FOR INTERIOR WORK, CONDUIT SHALL BE ZINC COATED EMT EXCEPT WHERE NOT PERMITTED BY CODE. USE SCHEDULE 40 PVC BELOW CONCRETE SLAB, IN DUCTBANKS, AND FOR EXTERIOR WORK WHERE NOT SUBJECT TO DAMAGE. USE IMC WHERE SUBJECT TO PHYSICAL DAMAGE.
   C. EMT FITTINGS SHALL BE COMPRESSION GLAND TYPE, OF MALLEABLE STEEL. CONNECTORS SHALL HAVE INSULATED THROATS. CAST, SET SCREW, OR INDENTER TYPE FITTINGS ARE NOT ACCEPTABLE. ALL FITTINGS FOR EMT SHALL BE MADE OF STEEL.
   D. ALL RACEWAY SHALL BE RUN CONCEALED, UNLESS OTHERWISE NOTED. FISH ALL NEW OUTLETS IN EXISTING WALLS, WHERE POSSIBLE. ALL RUNS SHALL BE NEAT AND SQUARE.
   E. LOW VOLTAGE CABLING NOT SPECIFIED TO BE INSTALLED IN CONDUIT, SHALL BE INSTALLED IN A CABLE TRAY SYSTEM OR J-HOOK SYSTEM CONSISTING OF MINIMUM 2" DIAMETER HOOKS LOCATED ON 3'-0" CENTERS IN ALL ACCESSIBLE CEILINGS. WHERE THERE ARE INACCESSIBLE CEILINGS, PROVIDE CONDUIT FOR ENTIRE LENGTH OF INACCESSIBILITY.
   F. RACEWAYS USED FOR LOW VOLTAGE SYSTEMS SUCH AS TELECOMMUNICATIONS, FIRE ALARM, SECURITY, CCTV, CONTROLS, AND SIMILAR CONDUITS ABOVE THE CEILING AND BACKBOARD(S) SHALL BE PROVIDED WITH INSULATED THROAT BUSHINGS AT EACH CONDUIT TERMINATION. THESE BUSHINGS SHALL BE INSTALLED PRIOR TO PULLING LOW-VOLTAGE CABLES.
   G. RACEWAY PENETRATIONS THROUGH FLOOR SLABS AND FIRE-RATED WALLS SHALL BE FILLED WITH IMPERVIOUS, NON-SHRINK GROUT SUFFICIENTLY TIGHT TO PREVENT THE TRANSFER OF SMOKE, WATER, AND DUST. ROOF PENETRATIONS SHALL BE WITHIN THE EQUIPMENT ROOF CURB.
   H. SUPPORT ALL CONDUIT WITH STRAPS AND CLAMPS.
   I. ALL CONDUIT SHALL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES, WHETHER EXPOSED OR NOT AND SUPPORTED FROM STRUCTURE AND PROPERLY SECURED.
   J. WHERE CONDUITS PASS THROUGH A BUILDING EXPANSION JOINT, PROVIDE GALVANIZED EXPANSION FITTINGS WITH BONDING JUMPERS.
   K. MINIMUM CONDUIT SIZE SHALL BE 3/4" FOR INTERIOR WORK, 1" FOR EXTERIOR WORK.
   L. PROVIDE MINIMUM 210# TEST NYLON PULL CORD AND NYLON BUSHINGS IN ALL EMPTY RACEWAYS.
   M. LIQUID-TIGHT METAL CONDUIT SHALL ONLY BE USED FOR FINAL CONNECTIONS TO EQUIPMENT AND ALL OTHER ROTATING AND VIBRATING EQUIPMENT, MAXIMUM LENGTH OF 3'-0".
   N. FLEXIBLE METAL CONDUIT, MINIMUM SIZE 3/8", SHALL ONLY BE USED FOR FINAL CONNECTION TO LIGHTING FIXTURES, MAXIMUM LENGTH OF 6'-0".
   O. PROVIDE PULL BOXES, SUCH THAT NO SINGLE CONDUIT RUN HAS BENDS IN EXCESS OF 360°. PULL BOXES SHALL BE SUITABLE AND APPROVED FOR THE INTENDED USE. WHERE CONDUITS PASS UNDER PAVED AREAS, THEY SHALL BE RGS.
   P. ALL CONDUIT BENDS/ELBOWS EMERGING FROM UNDERGROUND SHALL BE IMC AND SHALL EXTEND A MINIMUM OF 18" BELOW GRADE.
   Q. ALL UNDERGROUND RACEWAYS SHALL BE THOROUGHLY COATED WITH TWO COATS OF ASPHALTUM BITUMASTIC.
   R. ALL CONDUITS INSTALLED UNDERGROUND OR IN CONCRETE SHALL HAVE JOINTS MADE WATERTIGHT BY USE OF POLYETRA-FLUOROETHYLENE TAPE.
   S. THE USE OF AC OR NM CABLE IS NOT PERMITTED.
   T. THE USE OF MC CABLE IS NOT PERMITTED.

3. OUTLET BOXES:
   A. JUNCTION AND PULL BOXES SHALL BE CODE GAUGE GALVANIZED STEEL. ACCEPTED MANUFACTURERS SHALL BE STEEL CITY (THOMAS & BETTS), RACO, CROUSE-HINDS, APPLETON (EMERSON), OR APPROVED EQUIVALENT.
   B. OUTLET BOXES SHALL NOT BE MOUNTED BACK TO BACK IN COMMON WALLS.
   C. ATTACH EMT WITH CONNECTORS HAVING INSULATED THROAT.
   D. ATTACH BOXES TO STUD WORK USING CADDY BAR STRAPS THAT CONNECT TO TWO ADJACENT METAL STUDS TO PREVENT TWISTING OF BOX IN WALL.
   E. ALL OUTLET BOXES (INCLUDING TELEPHONE, CABLE TV, AND COMPUTER) SHALL HAVE COVER PLATES, BLANK IF NOT USED.
   F. ALL EXTERIOR BOXES SHALL BE WATER-TIGHT.

4. CONDUCTORS:
   A. CONDUCTORS SHALL BE MANUFACTURED BY SOUTHWIRE (SIMPULL), ENCORE (SUPERSLICK), UNITED COPPER (SLK), CERRO (SLP), OR APPROVED EQUAL, "PRE-LUBRICATED" BY THE MANUFACTURER.
   B. ALL CONDUCTORS SHALL BE COPPER, RATED 75° C WET/DRY EXCEPT WHERE OTHERWISE NOTED OR REQUIRED BY U.L. OR OTHER CODES.
   C. ALL CONDUCTORS SHALL BE SINGLE INSULATED CONDUCTOR, THHN/THWN-2. SIZES #10 AWG AND SMALLER SHALL BE SOLID, SIZES #8 AWG AND LARGER SHALL BE STRANDED.
   D. BRANCH CIRCUITS SHALL NOT BE SMALLER THAN #12 AWG. CONTROL WIRING MAY BE #14 AWG.
   E. CONDUCTORS SHALL BE COLOR CODED BLACK/RED/BLUE FOR 120/208 VOLT SYSTEMS AND BROWN/ORANGE/YELLOW FOR 277/480 VOLT SYSTEMS FOR A, B, AND C PHASES, RESPECTIVELY. NEUTRAL SHALL BE WHITE FOR 120/208 VOLT SYSTEMS AND NATURAL GRAY FOR 277/480 VOLT SYSTEMS. GROUND CONDUCTOR SHALL BE GREEN ON ALL SYSTEMS. ALL CONDUCTOR SIZES SHALL HAVE COLOR-CODED INSULATION. THE USE OF COLORED TAPE ON LARGER WIRE SIZES SHALL NOT BE ALLOWED.
   F. INSULATION SHALL BE DUAL RATED TYPE THHN/THWN-2 FOR FEEDERS AND BRANCH CIRCUITS. FIXTURE TAPS SHALL BE #12 THHN/THWN-2 IN FLEX WITH GREEN #12 AWG GROUNDING CONDUCTOR.
   G. ALL CONDUCTORS SHALL BE IN CONDUIT.
   H. WIRING TO LIGHTING FIXTURES SHALL BE AS REQUIRED BY UL LABEL.
   I. MULTI-WIRE BRANCH CIRCUITS SHALL NOT BE ALLOWED, UNLESS EXPLICITLY INDICATED ON THE DRAWINGS.
   J. JOINTS IN #10 AWG AND SMALLER SHALL BE MADE UP WITH CRIMPED CONNECTORS WITH INSULATING CAPS (NO TAPE) OR WIRENUTS (MAXIMUM OF 3 CONDUCTORS UNDER ANY CONNECTOR OR WIRENUT). LARGER WIRE SHALL USE SPLIT BOLTS OR BOLTED CLAMPS.
   K. ALL WIRING LUGS THROUGHOUT THE PROJECT, INCLUDING, BUT NOT LIMITED TO, BREAKERS, PANELBOARD/SWITCHBOARD LUGS, SAFETY SWITCH LUGS, MOTOR STARTER LUGS, TRANSFORMERS LUGS, WIRING DEVICE TERMINALS, AND ALL EQUIPMENT LUGS/TERMINALS SHALL BE RATED FOR USE WITH 75 DEGREE INSULATED CONDUCTORS AT THEIR 75 DEGREE AMPACITY AND SHALL BE SIZED AND SELECTED TO MATCH THE CONDUCTOR SIZE AND MATERIAL.
   L. CIRCUIT JOINTS SHALL NOT BE MADE ON DEVICE TERMINALS.
   M. WIRE WITHIN PANELBOARDS SHALL BE NEATLY TRAINED, SQUARED, BUNCHED, AND TAGGED.
   N. ALL SYSTEM FURNITURE CONNECTIONS SHALL COMPLY WITH NEC 605.
   O. GROUND ALL EQUIPMENT PER NEC ARTICLE 250. BOND WHERE CONDUITS ENTER ENCLOSURES THROUGH CONCENTRIC KNOCKOUTS. ALL FLEX, INCLUDING FIXTURE TAPS, SHALL INCLUDE GREEN GROUNDING CONDUCTOR, #12 AWG MINIMUM. PROVIDE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR IN EACH CONDUIT AND FOR EACH CIRCUIT, SIZED PER NEC 250-122.
   P. ALL CONDUCTORS INSTALLED IN VERTICAL RACEWAYS SHALL BE SUPPORTED AT INTERVALS AS REQUIRED PER NEC 300-19.
   Q. THE ELECTRICAL CONTRACTOR SHALL FOLLOW AND APPLY THE TABLE BELOW, REGARDLESS WHAT THE PANEL SCHEDULE INDICATES, FOR SIZING ALL 120V & 277V, 20 AMP BRANCH CIRCUITS (COPPER CONDUCTORS) TO ALLOW A MAXIMUM OF 3% VOLTAGE DROP FROM THE CIRCUIT BREAKER TO THE FIRST DEVICE ON THE BRANCH CIRCUIT AND ACHIEVE A MAXIMUM OF 5% VOLTAGE DROP ACROSS THE ENTIRE BRANCH CIRCUIT:

VOLTAGE	CONDUCTOR LENGTH *	BRANCH CIRCUIT
120	0' - 50'	#12
120	51' - 90'	#10
120	91' - 140'	#8
120	141' - 255'	#6
277	0' - 125'	#12
277	126' - 200'	#10
277	201' - 330'	#8
277	331' - 525'	#6

* - THE LENGTH IS MEASURED FROM THE CIRCUIT BREAKER TO THE FIRST DEVICE WHICH THE BRANCH CIRCUIT SERVES. WHERE THE DISTANCE EXCEEDS ABOVE, CONSULT WITH THE ENGINEER.

   R. WHERE ANY BRANCH CIRCUIT PHASE CONDUCTORS ARE INCREASED DUE TO VOLTAGE DROP NOTED IN NOTE "Q" ABOVE, THE ASSOCIATED EQUIPMENT GROUNDING CONDUCTOR IS TO INCREASE PROPORTIONALLY IN SIZE AS WELL PER NEC 250.122(B).
   S. ALL BRANCH CIRCUIT CONDUCTORS FROM ISOLATED POWER SOURCES SHALL BE INSTALLED IN IMC CONDUIT AND SHALL BE TYPE XHHW-2, COLOR CODED ORANGE FOR CONDUCTOR #1, BROWN FOR CONDUCTOR #2, AND YELLOW FOR CONDUCTOR #3.

5. WIRING DEVICES:
   A. WIRING DEVICES SHALL BE SPECIFICATION GRADE, MINIMUM, EQUAL TO COOPER QUALITY INDICATED BELOW OR AS MANUFACTURED BY HUBBELL, LEGRAND-PASS & SEYMOUR, LEVITON, OR APPROVED EQUAL, UNLESS OTHERWISE NOTED:

SWITCHES (120/277V) SHALL BE AS FOLLOWS:

SINGLE-POLE 20 AMP	COOPER AH1221
DOUBLE-POLE 20 AMP	COOPER AH1222
THREE-WAY 20 AMP	COOPER AH1223
FOUR-WAY 20 AMP	COOPER AH1224

DUPLEX RECEPTACLES SHALL HAVE A NYLON FACE AND SHALL BE AS FOLLOWS:

15 AMP DUPLEX	COOPER 5252
20 AMP DUPLEX	COOPER 5352
15 AMP DUPLEX GFCI	COOPER SGF15F
20 AMP DUPLEX GFCI	COOPER SGF20F
15 AMP DUPLEX TAMPER	COOPER TR5262
20 AMP DUPLEX TAMPER	COOPER TR5362
15 AMP DUPLEX GFCI-TAMPER	COOPER TRSGF15F
20 AMP DUPLEX GFCI-TAMPER	COOPER TRSGF20F
15 AMP DUPLEX IG	COOPER IG5262
20 AMP DUPLEX IG	COOPER IG5362
15 AMP DUPLEX SPD	COOPER 5262S
20 AMP DUPLEX SPD	COOPER 5362S
15 AMP DUPLEX IG-SPD	COOPER IG5262S
20 AMP DUPLEX IG-SPD	COOPER IG5362S

THE PART NUMBERS ABOVE ARE FOR WIRING DEVICE TYPE ONLY. SEE BELOW FOR WIRING DEVICE COLOR AND PLATE MATERIAL/COLOR.

   B. SEE MOUNTING HEIGHT ELEVATION DETAIL FOR STANDARD MOUNTING HEIGHTS OF ALL DEVICES, UNLESS OTHERWISE NOTED.
   C. THE COLOR OF ALL WIRING DEVICES (SWITCHES AND RECEPTACLES) SHALL BE AS DIRECTED BY THE ARCHITECT, UNLESS OTHERWISE NOTED. ALL COVER PLATES SHALL BE 302 STAINLESS STEEL. COVER PLATES IN MASONRY WALLS SHALL BE JUMBO SIZE.
   D. ALL WIRING DEVICES FED FROM THE EMERGENCY POWER SYSTEM SHALL BE RED.
   E. ALL WIRING DEVICES FED FROM A UPS SOURCE SHALL BE BLUE.
   F. EACH DUPLEX RECEPTACLE INDICATED TO BE ON A DEDICATED CIRCUIT SHALL BE 20 AMP TYPE.
   G. ADJACENT DEVICES SHALL HAVE A COMMON WALL PLATE.
   H. WEATHERPROOF COVERS SHALL BE "WHILE-IN-USE" SO PLUGS MAY BE INSTALLED WITHOUT COMPROMISING THE WP FUNCTION. COOPER #WIU-2 DOUBLE-GANG WITH CLEAR COVER OR APPROVED EQUAL.
   I. A MAXIMUM OF 10 GENERAL PURPOSE RECEPTACLES SHALL BE ON EACH BRANCH CIRCUIT.
   J. DIMMERS SHALL BE LINEAR SLIDE, PRESENT ON/OFF, SQUARE LAW DIMMING, W/RFI FILTERING AND VOLTAGE COMPENSATION CIRCUITING.
   K. ALL WALL MOUNTED OCCUPANCY/VACANCY SENSORS/SWITCHES SHALL BE INSTALLED WITH AN EQUIPMENT GROUNDING CONDUCTOR.
   L. GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) PROTECTION FOR PERSONNEL SHALL BE PROVIDED FOR ALL LOCATIONS PER NEC 210.8, INSTALLED IN A READILY ACCESSIBLE LOCATION. WHERE A DEVICE LOCATION IS NOT ACCESSIBLE, THE GFCI PROTECTION SHALL BE PROVIDED WITH THE BREAKER SERVING THE DEVICE.
   M. ALL GFCI RECEPTACLES SHALL HAVE AUTO-MONITORING / SELF-TEST FUNCTION AND REVERSE LINE-LOAD MISFIRE FUNCTION AND MEET ALL REQUIREMENTS OF UL 943 (LATEST EDITION).
   N. TAMPER-RESISTANT RECEPTACLES SHALL BE PROVIDED FOR ALL AREAS PER NEC 406.12, INCLUDING DWELLING UNITS, ATTACHED AND DETACHED GARAGES AND ACCESSORY BUILDINGS TO DWELLING UNITS, COMMON AREAS OF MULTIFAMILY DWELLINGS, GUEST ROOMS/GUEST SUITES/COMMON AREAS OF HOTELS AND MOTELS, CHILD-CARE FACILITIES, PRESCHOOL AND EDUCATION FACILITIES, BUSINESS OFFICES/CORRIDORS/WAITING ROOMS AND THE LIKE IN CLINICS/MEDICAL/DENTAL OFFICES AND OUTPATIENT FACILITIES, ASSEMBLY OCCUPANCIES INCLUDING PLACES OF AWAITING TRANSPORTATION/GYMNASIUMS/SKATING RINKS/AUDITORIUMS, DORMITORIES/STUDENT HOUSING, AND ASSISTED LIVING FACILITIES.

6. SUPPORTS:
   A. ALL EQUIPMENT SHALL BE ADEQUATELY SUPPORTED FROM STRUCTURE.
   B. INSERTS IN MASONRY SHALL BE LEAD OR FIBER IN DRILLED HOLES, OR CAST IN PLACE.
   C. NAILS OR POWDER ACTUATED FASTENERS SHALL NOT BE USED.
   D. EMT/IMC/RGS SUPPORTS SHALL BE A MAXIMUM OF 8'-0" APART AND A MAXIMUM OF 3'-0" FROM BOXES.
   E. LIGHTING FIXTURES MOUNTED IN OR ON CEILING SHALL BE SUPPORTED FROM STRUCTURE VIA 12 GAUGE STEEL WIRE. PROVIDE A MINIMUM OF FOUR WIRES, ONE ATTACHED TO EACH CORNER OF LAY-IN FIXTURES. RECESSED DOWNLIGHT FIXTURES SHALL BE SUPPORTED THE SAME. DO NOT SUPPORT RACEWAY OR FIXTURES FROM CEILING GRID OR DUCT WORK. USE U.L. LISTED GRID CLIPS ON ALL LAY-IN FIXTURES.

7. PAINTING:
   A. SUITABLE FINISH COAT SHALL BE PROVIDED FOR ALL EQUIPMENT. PANEL TUBS, COVERS, ETC. SHALL BE PRIMED AND ENAMELED TO BLEND WITH ADJACENT SURFACES, OR SHALL BE MANUFACTURER'S STANDARD COLOR BAKED ENAMEL FINISH, OR AS DIRECTED BY THE ARCHITECT.

8. TELECOMMUNICATIONS:
   A. FURNISH A COMPLETE TELEPHONE CONDUIT SYSTEM AS INDICATED ON THE DRAWINGS.
   B. TELECOMMUNICATION OUTLETS SHALL CONSIST OF A 4" SQUARE DEEP BOX WITH SINGLE GANG PLASTER RING. PROVIDE BLANK PLATE WITH KNOCKOUTS FOR OUTLETS, AS PERMANENT COVERS WILL BE PROVIDED BY A SEPARATE INSTALLER.
   C. PROVIDE MINIMUM 1" RACEWAY, UNLESS OTHERWISE NOTED, FROM EACH BOX TO ABOVE NEAREST ACCESSIBLE CEILING SPACE FOR J-HOOK SYSTEM OR TO CABLE TRAY AS APPLICABLE. PROVIDE MINIMUM 210# TEST NYLON PULL CORD AND NYLON BUSHINGS IN ALL EMPTY RACEWAYS.
   D. PROVIDE RACEWAYS FOR ALL EXTERIOR AND/OR EXPOSED LOCATIONS.
   E. PROVIDE GROUNDING FOR ALL TELEPHONE/DATA SYSTEMS AND EQUIPMENT PER REQUIREMENTS AND SPECIFICATIONS PROVIDED BY THE OWNERS DESIGNATED VENDOR.
   F. ALL LOW-VOLTAGE CABLING SHALL BE PLENUM-RATED.
   G. CONTRACTOR SHALL FURNISH AND INSTALL A #6 AWG GREEN INSULATED COPPER WIRE IN CONDUIT FROM THE MAIN ELECTRICAL GROUNDING BAR TO TELECOMMUNICATIONS GROUNDING BUS BAR.
   H. PROVIDE MOUNTING BACKBOARDS FOR COMMUNICATIONS EQUIPMENT. BACKBOARDS SHALL BE OF 3/4" TYPE AC, EXTERIOR PLYWOOD, PAINTED BOTH SIDES AND ALL EDGES WITH 2 COATS OF GRAY FLAME RETARDANT PAINT.
   I. VERIFY SITE LOCATION OF TELEPHONE SERVICES WITH APPROPRIATE VENDOR, PRIOR TO SUBMITTING BID. TELEPHONE SERVICE CONDUITS SHALL BE PROVIDED TO THE PROPERTY LINE OR POINT AS DIRECTED BY THE LOCAL UTILITY.
   J. ALL CABLE TRAY SHALL BE 12" WIDE X 4" DEEP, BASKET TYPE.
   K. CABLE TRAY SHALL SUPPORT TELE/DATA, INTERCOM, CATV, CCTV AND SECURITY CABLING

9. LIGHTING FIXTURES:
   A. TYPES AND MANUFACTURERS ARE SCHEDULED ON THE PLANS. EQUIVALENT FIXTURES BY OTHERS MAY BE SUBMITTED ONLY AS INDICATED ON THE PLANS AND ARE SUBJECT TO THE APPROVAL OF THE OWNER AND ENGINEER.
   B. ALL FIXTURES SHALL BE U.L. LISTED AND LABELED.
   C. LED DRIVERS AND/OR BALLASTS SHALL BE AS INDICATED IN THE LIGHTING FIXTURE SCHEDULE OR AS OTHERWISE NOTED.
   D. ALL FIXTURES SHALL BE PROVIDED FOR PROPER VOLTAGE BASED ON THE CIRCUIT ASSIGNMENT INDICATED ON THE PLANS.
   E. CATALOG NUMBERS ARE FOR GENERAL IDENTIFICATION OF FIXTURES ONLY. ALL RELATED PARTS, SUCH AS PLASTER RINGS, JUNCTION BOXES, LOUVERS, SHIELDS, MOUNTING STEMS, CANOPIES, CONNECTORS, STRAPS, NIPPLES, HARDWARE, ACCESSORIES, ETC., TO FIT THEM PROPERLY TO THE CONSTRUCTION, SHALL BE FURNISHED AND INSTALLED BY THIS CONTRACTOR. CONTRACTOR SHALL PROVIDE SUITABLE TRIM AND APPURTENANCES TO MOUNT FIXTURES IN TYPE OF CEILING OR WALL AS SPECIFIED IN ARCHITECTURAL FINISH SCHEDULES REGARDLESS OF CATALOG NUMBER GIVEN.
   F. ALL FIXTURES SHALL BE GROUNDED PER THE NEC.
   G. FIXTURES CONNECTED WITH FLEX TO THE RIGID RACEWAY PORTION OF THE WIRING SYSTEM SHALL CARRY A GREEN BONDING JUMPER WITHIN THE FLEX. THE JUMPER SHALL BE FASTENED TO BOTH THE FIXTURE AND THE RACEWAY SYSTEM WITH A STEEL CITY "G" CLIP OR APPROVED EQUIVALENT. PHASE AND GROUND CONDUCTORS RUN IN FLEX SHALL BE #12 AWG MINIMUM. MAXIMUM FLEX LENGTH SHALL BE 6'-0".
   H. MOUNT ALL FIXTURES PLUMB AND SQUARE WITH ROWS ALIGNED.
   I. SEE ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATION OF FIXTURES.
   J. CONTRACTOR SHALL COORDINATE FIXTURE TYPE AND TRIM WITH CEILING CONSTRUCTION AND ADJUST ACCORDINGLY WITHOUT ADDITIONAL EXPENSE.
   K. ALL LIGHTING FIXTURES SHALL BE THERMALLY PROTECTED PER THE NEC.
   L. LAMPS SHALL BE GENERAL ELECTRIC, PHILIPS, OR OSRAM/SYLVANIA EXCEPT WHERE OTHERWISE NOTED IN THE LIGHTING FIXTURE SCHEDULE OR OTHERWISE NOTED. ALL FIXTURES SHALL BE EQUIPPED WITH LAMPS.
   M. SURFACE-MOUNTED FLUORESCENT FIXTURES INSTALLED ON COMBUSTIBLE MATERIAL SHALL BE MOUNTED AT LEAST 1/4" FROM THE SURFACE OF THE MATERIAL, EXCEPT FOR FIXTURES WHICH ARE PLAINLY MARKED AS U.L. APPROVED FOR MOUNTING DIRECTLY TO SUCH SURFACES.
   N. FLUORESCENT LUMINAIRES THAT UTILIZE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL HAVE A DISCONNECTING MEANS, WHETHER INTEGRAL OR EXTERNAL, TO EACH LUMINAIRE PER NEC 410.130(G).
   O. FIXTURES IN CONTACT WITH INSULATION SHALL BE IC RATED.
   P. FOR RECESSED LIGHTING FIXTURES IN FIRE RATED CEILINGS, PROVIDE A MANUFACTURER APPROVED AND LISTED FIRE RATED COVER/ASSEMBLY OVER THE FIXTURE TO MAINTAIN THE INTEGRITY OF THE CEILING FIRE RATING. ANY LIGHTING FIXTURES INSTALLED UNDER THE FIRE RATED CAP SHALL BE SUITABLE FOR THE INSTALLATION.

10. LIGHTING CONTROLS:
   A. FURNISH AND INSTALL WHERE SHOWN AN ELECTRONIC TIME CONTROLLER AS MANUFACTURED BY TORK (NSI), PARAGON, INTERMATIC, OR APPROVED EQUAL. CONTACTS SHALL BE SPST OR AS INDICATED, RATED 120/277V AT 20A BALLAST LOAD, AND MINIMUM 30,000 SWITCHING CYCLES. PROVIDE WITH THE NUMBER OF CHANNELS INDICATED (MINIMUM 2 CHANNELS) OR AS REQUIRED TO MEET THE INTENT OF THE DRAWINGS. EACH CHANNEL SHALL BE INDIVIDUALLY PROGRAMMABLE WITH 128 ON-OFF OPERATIONS PER WEEK PLUS FOUR SEASONAL SCHEDULES TO MODIFY THE BASIC PROGRAM AND A HOLIDAY SCHEDULE THAT OVERRIDES THE WEEKLY OPERATION. THE CONTROLLER SHALL BE PROVIDED WITH A PHOTOELECTRIC SENSOR, ASTRONOMIC DIAL, AND A BATTERY BACKED-UP, NON-VOLATILE MEMORY FOR SCHEDULES AND TIME CLOCK.
   B. LIGHTING CONTACTORS SHALL SWITCH LOADS AT THE VOLTAGE AND AMPERE RATING INDICATED AND SHALL HAVE THE NUMBER OF POLES INDICATED ON THE DRAWINGS OR AS REQUIRED. THE CONTACTOR AND CONTACTS SHALL BE CONTINUOUSLY RATED FOR THE LOAD SERVED, INCLUDING TUNGSTEN FILAMENT, INDUCTIVE, AND HIGH-INRUSH BALLAST LOADS.
   C. ALL LIGHTING CONTACTORS SHALL BE ELECTRICALLY HELD AND BE INSTALLED IN A NEMA 1 ENCLOSURE, UNLESS OTHERWISE NOTED.

11. EQUIPMENT IDENTIFICATION:
   A. PROVIDE ENGRAVED PHENOLIC NAMEPLATES FOR ALL ELECTRICAL EQUIPMENT SUPPLIED FOR THE PROJECT, INCLUDING BUT NOT LIMITED TO, WIRING TROUGHS, SAFETY SWITCHES, DISCONNECTS, TRANSFORMERS, PANELBOARDS, SWITCHBOARDS, SWITCHGEARS, MOTOR CONTROL CENTERS (MCC), BUSWAYS, GENERATORS, AUTOMATIC TRANSFER SWITCHES (ATS), UNINTERRUPTIBLE POWER SUPPLY (UPS), POWER DISTRIBUTION UNITS (PDU), FLOOR/REMOTE DISTRIBUTION CABINETS (FDC/RDC), STATIC TRANSFER SWITCHES (STS), ETC. NAMEPLATE SHALL INDICATE THE DEVICE NAME, SYSTEM VOLTAGE (VOLTAGE/PHASE/WIRE), AND UPSTREAM DEVICE AND CIRCUIT. PROVIDE NAMEPLATES FOR CIRCUIT BREAKERS IN SWITCHGEARS, SWITCHBOARDS AND DISTRIBUTION PANELS.
   B. NAMEPLATE COLORS SHALL BE AS FOLLOWS:

120/208V EQUIPMENT	BLUE SURFACE WITH WHITE CORE
277/480V EQUIPMENT	BLACK SURFACE WITH WHITE CORE
FIRE ALARM SYSTEMS	BRIGHT RED SURFACE WITH WHITE CORE
SECURITY SYSTEMS	BURGUNDY SURFACE WITH WHITE CORE
TELEPHONE SYSTEMS	ORANGE SURFACE WITH WHITE CORE
DATA SYSTEMS	BROWN SURFACE WITH WHITE CORE
TV SYSTEMS	PURPLE SURFACE WITH WHITE CORE
EPO SYSTEMS	WHITE SURFACE WITH RED CORE

   C. NAMEPLATES UP TO 8 SQUARE INCHES SHALL NOT BE LESS THAN 1/16" THICK. NAMEPLATES LARGER THAN 8 SQUARE INCHES SHALL NOT LESS THAN 1/8" THICK.
   D. LETTERING HEIGHT SHALL BE 1/2" MINIMUM.
   E. NAMEPLATES SHALL BE ATTACHED WITH SELF-DRILLING/SELF-TAPPING SCREWS, EXCEPT RIVETS SHALL BE USED WHERE END OF SCREW IS NOT PROTECTED. QUANTITY AS FOLLOWS:

UP TO 5 SQUARE INCHES:	2 SCREWS
5 TO 12 SQUARE INCHES:	4 SCREWS
ABOVE 12 SQUARE INCHES:	6 SCREWS

12. DISCONNECTS:
   A. DISCONNECT SWITCHES SHALL BE HEAVY-DUTY TYPE IN NEMA 1 ENCLOSURES, UNLESS OTHERWISE NOTED, FUSED OR NON-FUSED AS INDICATED. SWITCHES SHALL HAVE REJECTION-TYPE FUSE CLIPS. SWITCHES SHALL BE BY EATON, SQUARE-D, GENERAL ELECTRIC, OR APPROVED EQUAL. WHERE FED FROM A LOAD CENTER, GENERAL-DUTY SWITCHES SHALL BE PERMITTED.
   B. FUSES LESS THAN 60A SHALL BE CLASS RK5, DUAL-ELEMENT, TIME-DELAY WITH INDICATION
   C. FUSES GREATER THAN 60A SHALL BE CLASS J, DUAL-ELEMENT, TIME-DELAY WITH INDICATION.
   D. A SET OF 3 SPARE FUSES OF EACH SIZE AND TYPE SHALL BE FURNISHED TO THE OWNER.

13. PANELBOARDS:
   A. PANELBOARDS SHALL BE PROVIDED AS MANUFACTURED BY EATON, SQUARE-D, GENERAL ELECTRIC, OR APPROVED EQUAL. ALL NEW EQUIPMENT FOR THE PROJECT SHALL BE BY THE SAME MANUFACTURER. LOAD CENTER TYPE PANELBOARDS SHALL BE USED WHERE THE PANELBOARD SERVES A DWELLING UNIT.
   B. ALL BUSSING, INCLUDING NEUTRAL AND GROUND, SHALL BE COPPER.
   C. ALL BREAKERS SHALL BE AUTOMATIC THERMAL-MAGNETIC TYPE MOLDED CASE BOLT-ON TYPE, CALIBRATED FOR 40 DEGREE C, OR AMBIENT COMPENSATION, UNLESS OTHERWISE NOTED.
   D. PANELS SHALL BE FULLY RATED (AIC). NO SERIES AIC RATINGS ARE ALLOWED.
   E. PANELS SHALL HAVE FULL SIZE EQUIPMENT GROUNDING BARS AND NEUTRAL BARS, EXCEPT WHERE INDICATED TO BE 200%.
   F. ALL PANELBOARD AND BREAKER LUGS SHALL BE SIZED AND RATED PER THE CONDUCTOR SIZE AND MATERIAL.
   G. LIGHTING AND APPLIANCE PANELS (100A-600A) SHALL HAVE FRONT ACCESSIBLE HINGED DOOR-IN-DOOR COVERS WITH DEAD FRONT, SHALL BE 20" WIDE MINIMUM WITH MINIMUM 4" WIDE WIRING GUTTERS.
   H. DISTRIBUTION PANELS (600A-1200A) SHALL HAVE FRONT ACCESSIBLE DEAD FRONT COVERS.
   I. PROVIDE HANDLE LOCK-ON DEVICES FOR ALL CIRCUIT BREAKERS CONNECTED TO EMERGENCY, EXIT, NIGHT LIGHTING, FIRE ALARM, TELEPHONE BOARDS, AND SECURITY SYSTEMS.
   J. BREAKERS USED FOR SWITCHING SHALL BE SWITCHING DUTY (SWD) RATED.
   K. BREAKERS USED FOR HEATING, AIR-CONDITIONING AND/OR REFRIGERATION SHALL BE HACR RATED.
   L. GROUND-FAULT CIRCUIT-INTERRUPTER (GFCI) PROTECTION FOR PERSONNEL SHALL BE PROVIDED FOR ALL LOCATIONS PER NEC 210.8, INSTALLED IN A READILY ACCESSIBLE LOCATION. WHERE A DEVICE LOCATION IS NOT ACCESSIBLE, THE GFCI PROTECTION SHALL BE PROVIDED WITH THE BREAKER SERVING THE DEVICE.
   M. ARC-FAULT CIRCUIT-INTERRUPTER (AFCI) PROTECTION SHALL BE PROVIDED FOR ALL LOCATIONS PER NEC 210.12, INSTALLED IN A READILY ACCESSIBLE LOCATION. THIS INCLUDES ALL 120V, 15A AND 20A BRANCH CIRCUITS IN DWELLING UNITS, DORMITORY/STUDENT HOUSING UNITS AND HOTEL/MOTEL GUEST ROOMS/SUITES AS DEFINED BY THE NEC.
   N. ALL OVERCURRENT DEVICES WHICH COMPRISE THE EMERGENCY SYSTEM OR LEGALLY REQUIRED STANDBY SYSTEM SHALL BE SELECTIVELY COORDINATED. THE ELECTRICAL CONTRACTOR SHALL PROVIDE MANUFACTURER DOCUMENTATION INDICATING COMPLIANCE WITH THE SELECTIVE COORDINATION REQUIREMENTS PER THE NEC.
   O. ALL PANELBOARDS SHALL HAVE METAL DIRECTORY FRAME. FOR EACH PANELBOARD, PROVIDE TYPED CIRCUIT DIRECTORY PER NEC 408.4. SPARE CIRCUIT BREAKERS SHALL BE LABELED SPARE AND IN THE OFF POSITION.
   P. ALL CIRCUIT BREAKERS RATED 1200A OR HIGHER, OR CAPABLE OF BEING RATED 1200A OR HIGHER (I.E. ADJUSTABLE LONG-TIME PICKUP OR REPLACEABLE TRIP/RATING PLUG), SHALL BE PROVIDED WITH AN ENERGY-REDUCING MAINTENANCE SWITCH WITH LOCAL STATUS INDICATOR PER NEC 240.87(B). THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMANCE TESTING (PRIMARY CURRENT INJECTION OR OTHER APPROVED METHOD) AND DOCUMENTATION REQUIRED PER NEC 240.87(C).

14. DRY-TYPE TRANSFORMERS:
   A. TRANSFORMERS SHALL BE FACTORY-ASSEMBLED, ENERGY EFFICIENT TYPE MEETING DEPARTMENT OF ENERGY 10-CFR-PART-431 REQUIREMENTS AS MANUFACTURED BY EATON, SQUARE-D, GENERAL ELECTRIC, OR APPROVED EQUAL.
   B. TRANSFORMERS SHALL HAVE (2)-2.5% FULL-CAPACITY ABOVE-NORMAL (FCAN) RATED VOLTAGE PRIMARY TAPS AND (4)-2.5% FULL-CAPACITY BELOW-NORMAL (FCBN) RATED VOLTAGE PRIMARY TAPS, MINIMUM.
   C. TRANSFORMER COILS SHALL BE COPPER, CONTINUOUS WOUND CONSTRUCTION, AND IMPREGNATED WITH A NON-HYGROSCOPIC, THERMOSETTING VARNISH. THE PRIMARY WINDINGS SHALL BE ISOLATED AND INSULATED FROM THE SECONDARY WINDING. THE CORE AND COIL ASSEMBLY SHALL BE INTEGRALLY MOUNTED ON VIBRATION ISOLATION SUPPORTS BETWEEN CORE AND COIL ASSEMBLY AND THE BASE OF THE ENCLOSURE.
   D. THE TRANSFORMER INSULATION SYSTEM SHALL BE CLASS 220 DEGREE C AND DESIGNED FOR FULL LOAD OPERATION AT RATED KVA WITH A MAXIMUM TEMPERATURE RISE OF 115 DEGREE C RISE OVER 40 DEGREE C AMBIENT.
   E. THE MAXIMUM TEMPERATURE OF THE TOP OF THE ENCLOSURE SHALL NOT EXCEED 50 DEGREE C RISE OVER 40 DEGREE C AMBIENT.
   F. TRANSFORMER ENCLOSURES SHALL BE VENTILATED AND FABRICATED OF HEAVY GAUGE, SHEET STEEL CONSTRUCTION WITH PERMANENTLY ATTACHED TRANSFORMER DATA LABEL.
   G. MAXIMUM SOUND LEVEL FOR TRANSFORMERS SHALL NOT EXCEED:
      45 DB FOR 15-50 KVA
      50 DB FOR 51-150 KVA
      55 DB FOR 151-300 KVA
      TRANSFORMER CONNECTIONS SHALL BE AT SIDES THROUGH LIQUID-TIGHT FLEXIBLE METAL CONDUIT WITH CONNECTIONS SUITABLE FOR CONDUCTOR MATERIAL.
   H. TRANSFORMER SECONDARY NEUTRAL SHALL BE PROPERLY GROUNDED AS A SERVICE GROUND. THE CORE AND COILS SHALL BE ELECTRICALLY GROUNDED TO THE ENCLOSURE WITH A FLEXIBLE GROUND STRAP.
   I. PROVIDE MANUFACTURER APPROVED AND LISTED WALL BRACKETS (75 KVA MAX) AND/OR CEILING MOUNTING BRACKETS (150 KVA MAX) WHERE INDICATED ON THE DRAWINGS.

15. FIRE ALARM SYSTEM:
   A. SYSTEM SHALL BE A CENTRALIZED, DIGITAL, ADDRESSABLE, FULLY ELECTRONICALLY SUPERVISED (INCLUDING AUXILIARY SYSTEMS INTERCONNECT WIRING) SYSTEM LISTED BY UL IN COMPLIANCE WITH ALL APPLICABLE NFPA 72 AND OTHER STANDARDS AS WELL AS THE AMERICAN'S WITH DISABILITIES ACT (ADA). ALL FINAL CONNECTIONS, TESTING AND ADJUSTMENTS SHALL BE PERFORMED BY OR UNDER DIRECT SUPERVISION OF AN AUTHORIZED FACTORY REPRESENTATIVE. SYSTEM SHALL BE EDWARDS, NOTIFIER, SIEMENS, OR APPROVED EQUAL AS ACCEPTED BY THE ENGINEER. SYSTEM SHALL HAVE A 60HR MINIMUM BATTERY BACKUP.
   B. INITIATING DEVICE ACTIVATION SHALL CAUSE OPERATION OF THE PROPER ALARM CIRCUIT IN THE CONTROL PANEL, AND OPERATE ALL AUDIBLE AND VISUAL INDICATING ALARMS. ALL AIR HANDLING UNITS SHALL BE STOPPED UPON ANY ALARM INPUT. EACH AIR HANDLER UNIT SHALL BE PROVIDED WITH A SYSTEM CONTROLLED RELAY TO EFFECT SHUTDOWN. ALL ALARM DEVICES AND LAMPS SHALL CONTINUE TO OPERATE UNTIL THE INITIATING DEVICE IS RESET. SUBSEQUENT ALARMS SHALL RESOUND THE SYSTEM. AN AUDIBLE AND VISUAL SIGNAL SHALL INDICATE SYSTEM TROUBLE. THE CONTROL PANEL SHALL PROVIDE FOR ACTIVATING A UL LISTED CENTRAL STATION SIGNAL FOR NOTIFYING THE FIRE DEPARTMENT.
   C. MANUAL STATIONS SHALL BE NON-CODED, WITH PULL LEVER AND GLASS ROD, SEMI-FLUSH MOUNTED. COMBINATION LIGHT AND HORN SIGNALS SHALL BE FLUSH MOUNTED. WIRING SHALL BE IN CONDUIT AS PREVIOUSLY SPECIFIED, #14 AWG MINIMUM, THHN. ALL J-BOXES USED FOR THE FIRE ALARM SYSTEM SHALL BE PAINTED RED.
   D. SPRINKLER SYSTEM TAMPER SWITCHES SHALL BE CONNECTED INTO A COMMON ZONE WHICH SHALL DISTINGUISH BETWEEN A CONDUIT FAULT AND A CLOSED VALVE. A CLOSED VALVE SHALL BE INDICATED AS AN ALARM CONDITION, BUT WILL NOT ACTIVATE THE AUDIO-VISUAL DEVICES AND SHALL CAUSE A SUPERVISORY SIGNAL TO BE TRANSMITTED TO THE CENTRAL STATION.
   E. CONDUCTORS SHALL BE PLENUM-RATED AND INSTALLED IN CONDUIT AND INSTALLED IN COMPLIANCE WITH NFPA 70, ARTICLE 760; IN ADDITION TO WIRING METHODS 300.4.
   F. ALL FIRE ALARM WIRING SHALL BE CLASS A.
   G. PROVIDE ALL REQUIRED MODULES, POWER EXTENDERS, PROGRAMMING, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM.
   H. SUBMIT FIRE ALARM SHOP DRAWINGS CONSISTING OF PRODUCT DATA, TO THE ENGINEER AND FOR APPROVAL.
   I. FILL OUT NFPA 72 CERTIFICATION REPORT AND SUBMIT TO ENGINEER AND AUTHORITY HAVING JURISDICTION.
   J. WARRANTY - ALL WORK PERFORMED AND ALL MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE FREE FROM DEFECTS AND SHALL REMAIN SO FOR A PERIOD OF AT LEAST TWO (2) YEARS FROM THE DATE OF ACCEPTANCE BY THE PROFESSIONAL ENGINEER AND/OR OWNER. THE FULL COST OF MAINTENANCE, LABOR, AND MATERIALS REQUIRED TO CORRECT ANY DEFECT DURING THIS TWO YEAR PERIOD SHALL BE IMMEDIATELY CORRECTED AT NO ADDITIONAL COST TO THE OWNER. ANY DEFECTS THAT RENDER THE SYSTEM INOPERATIVE SHALL BE REPAIRED WITHIN 24 HOURS OF THE OWNER NOTIFYING THE CONTRACTOR. OTHER DEFECTS SHALL BE REPAIRED WITHIN 48 HOURS OF THE OWNER NOTIFYING THE CONTRACTOR.
   K. PROVIDE CARBON MONOXIDE SENSOR FOR ALL BUILDINGS WITH GAS FIRED APPLIANCES. INCLUDE AT SOURCE LOCATIONS OF CO PRODUCING APPLIANCES AND WITHIN ALL SLEEPING ROOMS. REPORT TO FACP AS SUPERVISORY SIGNAL.

16. FIRE STOPPING:
   A. ALL PENETRATIONS OF RATED ASSEMBLIES SHALL BE SEALED WITH RATED MATERIALS MEETING ASTM E-814.
   B. PROVIDE FIRESTOPPING DEVICE(S) OR SYSTEM(S) WHICH HAVE BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814. INSTALL THE DEVICE(S) OR SYSTEM(S) IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE THE APPROPRIATE DEVICE(S) OR SYSTEM(S) WITH AN 'F' RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED.
   C. DEVICE(S) AND/OR SYSTEM(S) SHALL BE BY HILTI, 3M OR EQUIVALENT.

17. SEISMIC:
   A. THE ELECTRICAL CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR PROVIDING SEISMIC SUPPORT AND BRACING OF ELECTRICAL COMPONENTS TO RESIST THE EFFECTS OF EARTHQUAKES ON THE ELECTRICAL SYSTEM AS WELL AS ANY REQUIRED SPECIAL INSPECTIONS BASED ON THE SPECIFIC GEOGRAPHIC LOCATION AS REQUIRED. THE SEISMIC RESTRAINTS AND SPECIAL INSPECTIONS SHALL MEET ALL APPLICABLE STATE AND LOCAL BUILDING CODE REQUIREMENTS AS WELL AS ASCE-7 REQUIREMENTS.

18. ELECTRICAL COORDINATION WITH OTHER TRADES:
   A. THE ELECTRICAL CONTRACTOR SHALL CONNECT AND/OR PROVIDE FINAL CONNECTIONS TO ALL EQUIPMENT SUPPLIED BY OTHERS APPLICABLE TO THE PROJECT, INCLUDING BUT NOT LIMITED TO, MECHANICAL, PLUMBING, FIRE PROTECTION AND SUPPRESSION, OWNER FURNISHED, KITCHEN, LABORATORY, ETC. UNLESS OTHERWISE NOTED.
   B. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONNECTIONS PRIOR TO ROUGH-IN USING APPROVED CATALOG SHEETS AND SHOP DRAWINGS.
   C. THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL MANUAL MOTOR STARTER SWITCHES, DISCONNECT SWITCHES, RECEPTACLES, ETC. TO MECHANICAL AND PLUMBING EQUIPMENT. ALL STARTERS, OTHER THAN MANUAL STARTER SWITCHES, SHALL BE PROVIDED BY OTHERS, BUT INSTALLED BY THE ELECTRICAL CONTRACTOR.
   D. ALL DISCONNECT SWITCHES AND FUSE SIZES SHALL BE COORDINATED WITH SHOP DRAWINGS PRIOR TO ORDERING OR INSTALLING. ANY EQUIPMENT INSTALLED INCORRECTLY BECAUSE OF LACK OF COORDINATION WILL BE REMOVED AND INSTALLED CORRECTLY AT THE EXPENSE OF THE ELECTRICAL CONTRACTOR.
   E. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL CONDUIT RUNS AND LIGHT FIXTURE LOCATIONS ABOVE THE CEILING WITH OTHER TRADES PRIOR TO INSTALLATION.
   F. ALL DUCT SMOKE DETECTORS SHALL BE PROVIDED AND CONNECTED BY THE ELECTRICAL CONTRACTOR, BUT INSTALLED BY THE MECHANICAL CONTRACTOR.
   G. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY OUTLETS FOR HEAT TAPE CONNECTIONS FOR MECHANICAL SYSTEMS. PROVIDE CLASS B (30mA) GFCI PROTECTION ON THE BREAKER SUPPLYING THE HEAT TAPE.
   H. THE ELECTRICAL CONTRACTOR SHALL PROVIDE 120V POWER AT EACH HVAC UNIT HAVING A CONTROLS POWER SUPPLY. CIRCUIT(S) SHALL BE DEDICATED 20A SERVING A MAXIMUM OF 10 HVAC UNITS PER CIRCUIT. COORDINATE ALL LOCATIONS WITH THE MECHANICAL CONTRACTOR.

19. COORDINATION DRAWINGS:
   A. THE MECHANICAL CONTRACTOR SHALL ORGANIZE COORDINATION MEETINGS TO DEVELOP A SET OF DRAWINGS WITH ALL CONTRACTORS (ELECTRICAL, MECHANICAL, PLUMBING, FIRE PROTECTION, IT/DATA, SECURITY AND GENERAL). THE MECHANICAL CONTRACTOR WILL HAVE THE LEAD RESPONSIBILITY FOR THE COORDINATION DRAWINGS. THE MECHANICAL CONTRACTOR SHALL PRODUCE THE ORIGINAL DRAWINGS AND FORWARD THE DRAWINGS TO EACH OF THE OTHER CONTRACTORS FOR THEM TO ADD THEIR SYSTEMS TO THIS SET OF COORDINATION DRAWINGS. THE CONTRACTORS WILL DEVELOP THE DRAWINGS IN THIS ORDER: MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, IT/DATA (INCLUDING CABLE TRAY), SECURITY, AND GENERAL. THIS SHALL ALSO BE THE ORDER OF PRECEDENCE FOR INSTALLATION OF SYSTEMS. ANY RELOCATION OF SYSTEM ROUTINGS WILL BE FOUND IN THE COORDINATION PHASE AND NOTICED BY EACH OF THE CONTRACTORS. THESE DRAWINGS, WHEN COMPLETED, SHALL BE SIGNED OFF BY ALL OF THE ABOVE LISTED PARTIES. DRAWINGS SHALL BE COMPLETED PRIOR TO PURCHASE, FABRICATION OR INSTALLATION OF EQUIPMENT AND/OR SYSTEMS. THE FOLLOWING ITEMS REPRESENT THE MINIMUM REQUIREMENTS FOR SHOP DRAWINGS AND COORDINATION DRAWINGS:
      1. ALL SHOP AND COORDINATION DRAWINGS WILL BE 1/4"=1'-0" SCALE.
      2. DRAWINGS WILL BE ORIGINAL DRAWINGS AND NOT OVERLAYS OF THE CONTRACT/DESIGN DRAWINGS.
      3. COORDINATION DRAWINGS WILL BE DRAWN ON REPRODUCIBLE MATERIAL 48"x36".
      4. COORDINATION DRAWINGS ARE NOT SHOP DRAWINGS AND ARE REQUIRED IN ADDITION TO SHOP DRAWINGS.

   ONCE THE COMPLETE COORDINATION DRAWINGS HAVE BEEN COMPILED, THE MECHANICAL CONTRACTOR WILL DISTRIBUTE ONE SIGNED SET TO EACH OF THE FOLLOWING CONTRACTORS: ELECTRICAL, PLUMBING, FIRE PROTECTION, IT/DATA, AND GENERAL. ADDITIONAL SETS WILL BE SENT TO THE OWNER, ARCHITECT, AND ENGINEER.

20. TESTING AND DOCUMENTATION:
   A. THE ELECTRICAL CONTRACTOR SHALL ENGAGE THE GEAR MANUFACTURER OR ANOTHER INDEPENDENT 3RD PARTY TO PROVIDE A COMPLETE FAULT CURRENT, COORDINATION, AND ARC-FLASH HAZARD ANALYSIS STUDY AND REPORT, COMPLETE WITH ARC-FLASH HAZARD LABELS FOR ALL EQUIPMENT.
   B. TESTING AND DOCUMENTATION SHALL BE PROVIDED AS FOLLOWS:
      1. ALL CONDUCTORS SHALL BE MEGGERED BEFORE FINAL CONNECTIONS.
      2. THE GROUND SYSTEM SHALL BE TESTED AND VERIFIED TO BE 25 OHMS OR LESS RESISTANCE-TO-GROUND.
      3. A PRIMARY INJECTION TEST SHALL BE PERFORMED ON ALL CIRCUIT BREAKERS RATED 225A OR HIGHER.
      4. GFCI EQUIPPED BREAKERS SHALL BE PERFORMANCE TESTED.
      5. LIGHTING CONTROL SYSTEMS SHALL BE TESTED FOR PROPER OPERATION OF SETPOINTS.
      6. GENERATOR TESTING SHALL INCLUDE AN 8-HOUR, 100% LOAD BANK AND TRANSIENT TESTING. POWER QUALITY ANALYZERS SHALL BE USED FOR WAVEFORM CAPTURE AND TRANSIENT RESPONSE DOCUMENTATION.
      7. UPS TESTING SHALL INCLUDE AN 8-HOUR, 100% LOAD BANK, TRANSIENT TESTING, AND BATTERY DISCHARGE TESTING. POWER QUALITY ANALYZERS SHALL BE USED FOR WAVEFORM CAPTURE AND TRANSIENT RESPONSE DOCUMENTATION.
      8. ATS TESTING SHALL INCLUDE TRANSFER FUNCTIONS, VERIFICATION OF TIMER/PICKUP/DROP-OUT SETPOINTS AND LOAD/NO-LOAD TEST OPERATION.

21. COMMISSIONING:
   A. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR EQUIPMENT/SYSTEM START-UP AND TESTING. THE ELECTRICAL CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR EQUIPMENT/SYSTEM COMMISSIONING AS DIRECTED BY THE COMMISSIONING AUTHORITY (CxA). THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE COMMISSIONING AUTHORITY AND PROVIDE ALL NECESSARY TIME, EQUIPMENT, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT.
   B. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR SYSTEM COMMISSIONING PER 2018 NCECC SECTION C408. WHERE INDEPENDENT COMMISSIONING AGENT IS NOT ENGAGED BY THE OWNER, THE EC SHALL HIRE A REGISTERED DESIGN PROFESSIONAL (ENGINEER SEALED IN N.C. OR CERTIFIED COMMISSIONING PROFESSIONAL) TO PERFORM THE COMMISSIONING DUTIES DESCRIBED IN SECTION C408, AND PROVIDE THE OWNER AND CODE OFFICIAL WITH A SEALED STATEMENT OF COMPLETION (APPENDIX C1). THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE COMMISSIONING AGENT AND PROVIDE ALL NECESSARY TIME, MATERIALS, AND PROCEDURES REQUIRED FOR A FULLY COMMISSIONED PROJECT.

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3/3/25

RICHMOND COMMUNITY COLLEGE HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

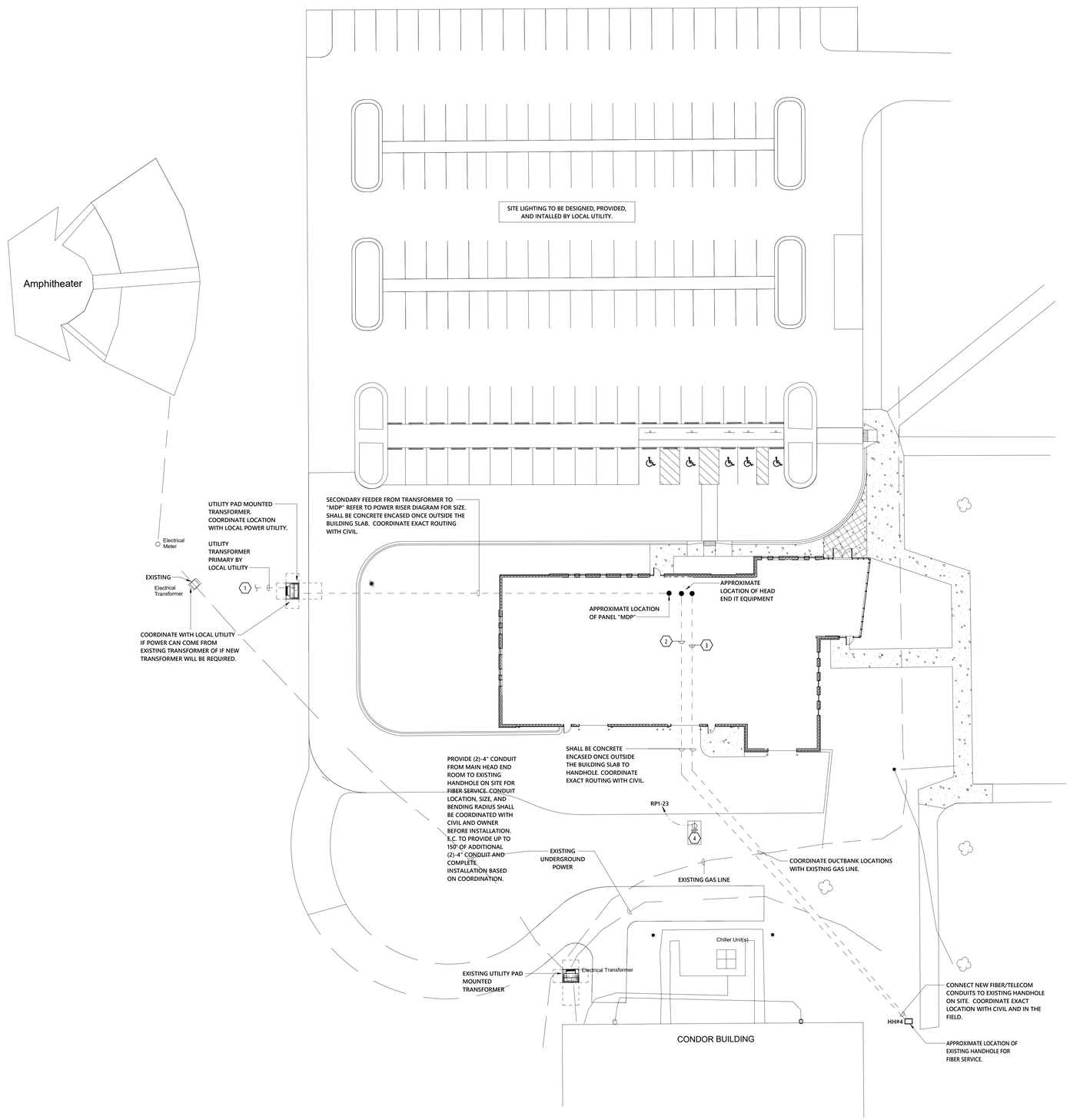
ELECTRICAL SPECIFICATIONS

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
E002

Opt # 23-0128



General Notes - Site Plans

A.	ALL LIGHTING AND POWER CONDUCTORS SHALL BE INSTALLED BETWEEN 24" (MINIMUM) AND 36" (MAXIMUM) BELOW FINISHED GRADE.
B.	ALL COMMUNICATIONS CONDUIT AND CABLES SHALL BE INSTALLED 36" (MINIMUM) BELOW FINISHED GRADE.
C.	ALL CONDUCTORS FOR EXTERIOR LIGHTING AND POWER CIRCUITS SHALL BE #10 AWG MINIMUM.
D.	ALL LOW VOLTAGE CONDUIT RUNS SHALL HAVE HAND HOLES/PULL BOXES SUPPLIED AT 150' INTERVALS UNLESS OTHERWISE INDICATED BY LOCAL UTILITY. MINIMUM SIZE SHALL BE 36" X 36".
E.	SITE LIGHTING TO BE DESIGNED, PROVIDED, AND INTALLED BY LOCAL UTILITY.

KEYNOTES

#	Keynote Description
1	PROVIDE (2)-6" CONDUIT FROM PAD MOUNTED TRANSFORMER TO DESIGNATED POINT AT EDGE OF PROPERTY FOR LOCAL POWER UTILITY USE. CONDUIT LOCATION, SIZE, AND BENDING RADIUS SHALL BE COORDINATED WITH UTILITY BEFORE INSTALLATION. PULLBOXES AS REQUIRED BY CODE/LOCAL UTILITY. E.C. TO PROVIDE UP TO 150' OF ADDITIONAL (2)-6" CONDUIT AND COMPLETE INSTALLATION BASED ON UTILITY COORDINATION.
2	PROVIDE (2)-4" CONDUIT FROM MAIN HEAD END ROOM TO EXISTING HANDHOLE ON SITE FOR FIBER SERVICE. CONDUIT LOCATION, SIZE, AND BENDING RADIUS SHALL BE COORDINATED WITH CIVIL AND OWNER BEFORE INSTALLATION. E.C. TO PROVIDE UP TO 150' OF ADDITIONAL (2)-4" CONDUIT AND COMPLETE INSTALLATION BASED ON COORDINATION.
3	PROVIDE (1)-4"CONDUIT FROM MAIN HEAD END ROOM TO EXISTING HANDHOLE ON SITE FOR TELECOM SERVICE. CONDUIT LOCATION, SIZE, AND BENDING RADIUS SHALL BE COORDINATED WITH CIVIL AND OWNER BEFORE INSTALLATION.
4	DOMESTIC SERVICE BACKFLOW, COORDINATE EXACT LOCATION WITH CIVIL PLANS.

UTILITY XFMR CLEARANCES FROM BUILDINGS AND BUILDING OPENINGS

TYPE OF CONSTRUCTION	CLEARANCE EXTENDING OUT FROM BUILDING	SIDE CLEARANCE	HEIGHT CLEARANCE
NON-COMBUSTIBLE	3 FT	-	-
COMBUSTIBLE	10 FT	-	-
DOORS	20 FT	10 FT	-
WINDOWS (1ST STORY)	10 FT	10 FT	-
WINDOWS (2ND STORY)	REFER TO WALL TYPE	REFER TO WALL TYPE	-
AIR INTAKES	10 FT	10 FT	-
FIRE ESCAPES	20 FT	20 FT	-

NOTE:

1. DISTANCES ARE FROM THE PAD OR TRANSFORMER WHICHEVER IS CLOSER TO THE BUILDING OR OPENING.
2. A MINIMUM CLEAR WORKING SPACE OF 3 FT. MUST BE MAINTAINED FROM EACH SIDE OF THE TRANSFORMER AND A MINIMUM OF 10 FT. FROM THE FRONT (DOOR SIDE).
   2.1. WHERE A METER IS MOUNTED TO A TRANSFORMER, A CLEAR SPACE AROUND THE METER OF AT LEAST 3 FT WIDE, 4 FT DEEP, AND 8 FT HIGH MUST BE PROVIDED.

UTILITY XFMR CLEARANCES FROM EQUIPMENT

TYPE OF EQUIPMENT	MINIMUM DISTANCE
FUEL OR GAS DISPENSERS	20 FT
CONTAINERS OF FLAMMABLE LIQUIDS OR GAS. (OXYGEN, LP, GASOLINE, ETC.)	10 FT
CUSTOMER-OWNED GENERATORS OR TRANSFORMERS	10 FT
FIRE HYDRANTS, SPRINKLER VALVES, STANDPIPES, ETC.	4 FT
NATURAL GAS METER	3 FT

NOTE:

1. DISTANCES ARE FROM THE PAD OR SURFACE MOUNTED EQUIPMENT, WHICHEVER IS CLOSER TO THE BUILDING OR OPENING.
2. A MINIMUM CLEAR WORKING SPACE OF 3 FT. MUST BE MAINTAINED FROM EACH SIDE OF THE TRANSFORMER AND A MINIMUM OF 10 FT. FROM THE FRONT.

2	TYPICAL UTILITY TRANSFORMER CLEARANCES FROM EQUIPMENT AND UTILITY TRANSFORMER CLEARANCES FROM BUILDINGS AND BUILDING OPENINGS

1 **SITE-ELECTRICAL PLAN**
1" = 20'-0"

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

N TRUE NORTH

N PLAN NORTH

Opt # 23-0128

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3/3/25

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ELECTRICAL SITE PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

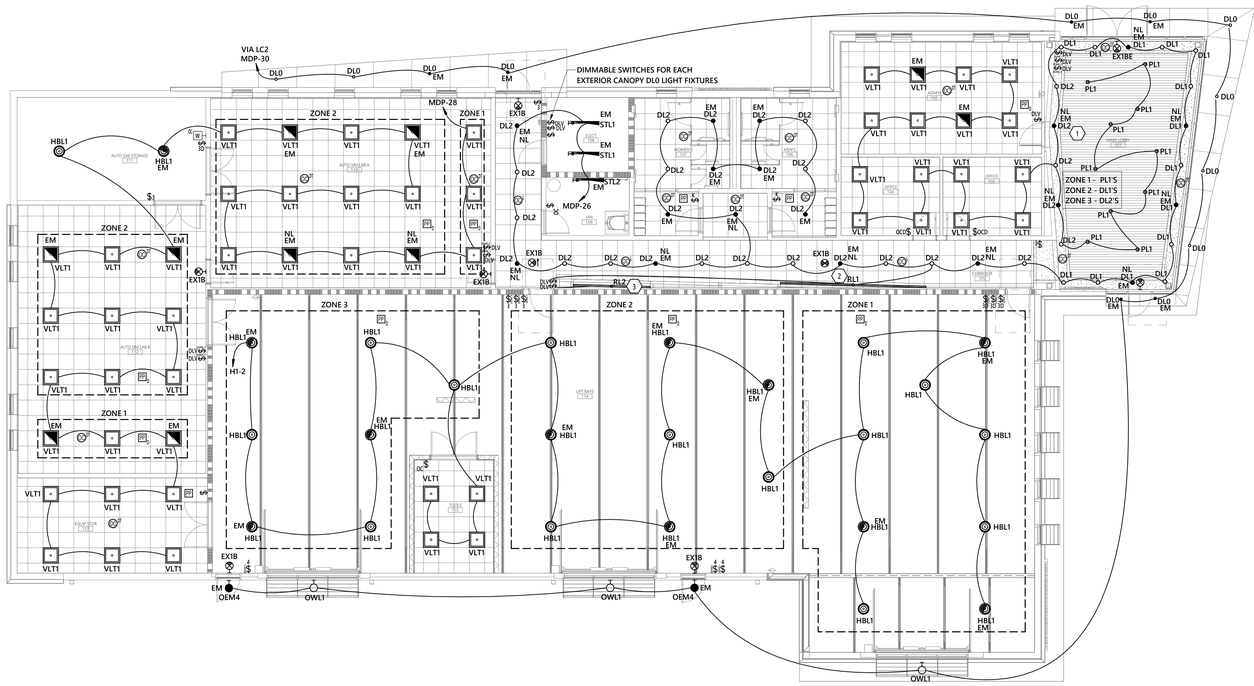
SHEET NUMBER
E010

General Notes - Lighting

A.	ALL RECESSED LIGHTING FIXTURES IN LAY-IN CEILINGS SHALL BE INSTALLED WITH 6' LONG FLEXIBLE METAL CONDUIT.
B.	ALL MOUNTING HEIGHTS FOR LIGHTING FIXTURES ARE TO THE BOTTOM OF THE FIXTURES UNLESS INDICATED OTHERWISE.
C.	SEE ARCHITECTURAL EXTERIOR ELEVATIONS FOR MOUNTING HEIGHTS OF EXTERIOR LIGHTING FIXTURES.
D.	REFER TO SECTION 26 0519 FOR MINIMUM CONDUCTOR SIZE ADJUSTMENTS FOR VOLTAGE DROP.
E.	WIRE COUNTS FOR CIRCUIT CONDUCTORS ARE NOT SHOWN. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.
F.	CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE PANELBOARD SCHEDULE). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL EQUIPMENT SCHEDULE.
G.	EMERGENCY DRIVERS / EXIT SIGNS SHALL BE CONNECTED TO LOCAL LIGHTING CIRCUIT, AHEAD OF ANY SWITCHING.

KEYNOTES

#	Keynote Description
1	DL2 LIGHT FIXTURES IN THIS AREA ARE TO BE MOUNTED IN THE UPPER SOFFIT. DL1 LIGHT FIXTURES IN THIS AREA ARE TO BE MOUNTED IN THE LOWER SOFFIT. COORDINATE EXACT FIXTURE LOCATIONS WITH ARCHITECT AND OWNER.
2	FIXTURE TO BE CONTINUOUS IN BULKHEAD. COORDINATE LENGTHS AND LOCATIONS WITH ARCHITECT.
3	FIXTURE TO BE LOCATED INSIDE RECESSED DISPLAY CABINET. COORDINATE EXACT LOCATION AND LENGTHS WITH ARCHITECT.



1 **LIGHTING REFLECTED CEILING PLAN**
1/8" = 1'-0"

LIFE SAFETY PLAN LEGEND:

2 HOUR RATED WALL. UL U905 / U419

N TRUE NORTH

N PLAN NORTH

0 5 10 20
SCALE: 1/8" = 1'=0"

Opt # 23-0128

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LIGHTING FLOOR PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

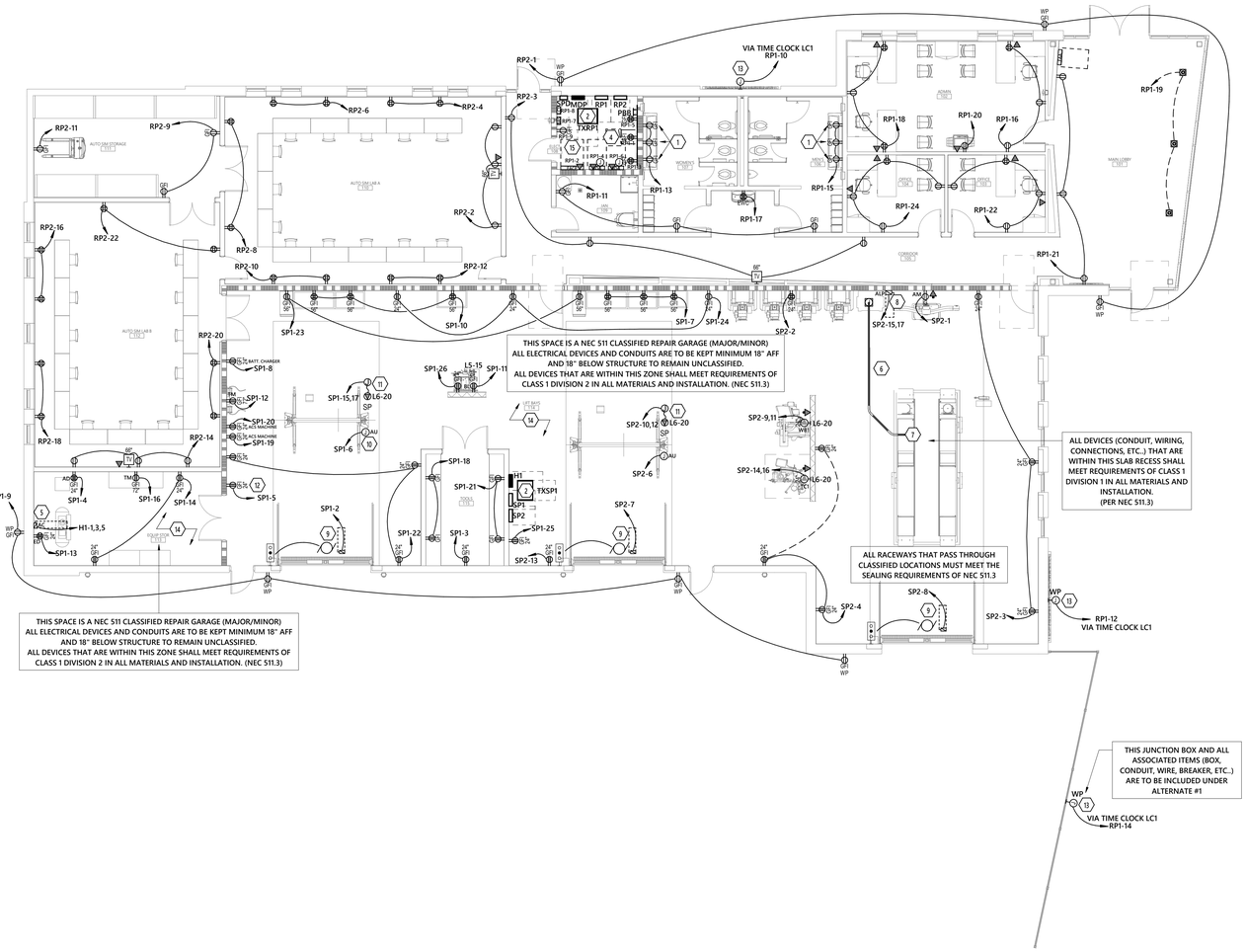
SHEET NUMBER
E101

General Notes - Power

A.	WHERE CONNECTED TO A 20A, BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.
B.	PROVIDE HOUSEKEEPING PADS FOR ALL FLOOR MOUNTED AND GRADE MOUNTED ELECTRICAL EQUIPMENT. MINIMUM REQUIREMENTS: 4" HIGH, 4% AIR ENTRAINED, POLYFIBER REINFORCED CONCRETE, 4" WIDER AND 4" LONGER THAN EQUIPMENT TO BE PLACED ON IT. REFER TO ELECTRICAL DETAIL DRAWINGS FOR TRANSFORMER, GENERATOR, OR SWITCHGEAR PADS THAT MAY EXCEED THESE REQUIREMENTS.
C.	REFER TO SECTION 26 0519 FOR MINIMUM CONDUCTOR SIZE ADJUSTMENTS FOR VOLTAGE DROP.
D.	WIRE COUNTS FOR CIRCUIT CONDUCTORS ARE NOT SHOWN. PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUIT AND SWITCHING CONNECTIONS SHOWN.
E.	CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE PANELBOARD SCHEDULE). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL EQUIPMENT SCHEDULE.

KEYNOTES

#	Keynote Description
1	UNDERCOUNTER GFCI RECEPTACLE TO BE USED FOR FAUCET POWER. COORDINATE EXACT LOCATIONS/QUANTITIES/HEIGHTS WITH PLUMBING CONTRACTOR PRIOR TO ROUGH-IN.
2	TRANSFORMER TO BE SUSPENDED / WALL MOUNTED ABOVE ELECTRICAL PANELS. COORDINATE WITH STRUCTURAL ENGINEER WITH WEIGHTS.
4	OWNER PROVIDED AND INSTALLED WALL MOUNTED DATA RACK. COORDINATE EXACT LOCATON WITH OWNER PRIOR TO ROUGH-IN. VERIFY EXACT POWER REQUIREMENTS AND NEEDS WITH OWNERS EQUIPMENT PRIOR TO ROUGH-IN.
5	30/FPN-3P DISCONNECT FOR AIR COMPRESSOR. COORDINATE FINAL CONNECTION REQUIREMENTS WITH EQUIPMENT PROVIDER (DSD).
6	4" THREADED RMC OR IMC CONDUIT FROM ALIGNMENT CONSOLE TO RECESSED FLOOR AT LIFT. MAX CONDUIT RUN OF 192". COORDINATE WITH EQUIPMENT PROVIDER (DSD) AND MANUFACTURER REQUIREMENTS PRIOR TO ROUGH-IN. INSTALLATION SHALL MEET NEC 511.8.
7	COORDINATE CONNECTION FROM CONDUIT EXIT TO LIFT WITH EQUIPMENT PROVIDER (DSD) AND MANUFACTURER. CONDUIT ENTRANCE SHALL BE SEALED AND MEET REQUIREMENTS OF NEC 511.9
8	60/FPN-2P DISCONNECT FOR ALIGNMENT LIFT. COORDINATE FINAL CONNECTION REQUIREMENTS WITH EQUIPMENT PROVIDER (DSD).
9	COORDINATE BAY DOOR MOTOR LOCATION, DISCONNECT SIZE AND LOCATION, RAISE/LOWER SWITCH LOCATION, AND OTHER POWER/CONDUIT REQUIREMENTS WITH DOOR PROVIDER PRIOR TO ROUGH-IN.
10	PROVIDE J-BOX FOR AIR/ELECTRIC UTILITY BOX TO BE INSTALLED BY EQUIPMENT PROVIDER (DSD). COORDINATE EXACT MOUNTING HEIGHT AND LOCATIONS AND REQUIREMENTS WITH DSD PRIOR TO ROUGH-IN.
11	PROVIDE SHORE POWER DROP FOR CONNECTION TO 2-POST LIFT LIMIT SWITCH. COORDINATE EXACT LOCATIONS AND POWER CONNECTION REQUIREMENTS WITH EQUIPMENT PROVIDER (DSD) PRIOR TO ROUGH-IN.
12	RECEPTACLE FOR FLUID DEFENDER CONTROL BOX. COORDINATE EXACT LOCATION AND MOUNTING HEIGHT WITH EQUIPMENT PROVIDER PRIOR TO ROUGH-IN.
13	PROVIDE FLUSH MOUNTED WP J-BOX AT LOCATION FOR BUILDING MOUNTED SIGNAGE. COORIDNATE EXACT J-BOX QUANTITY AND LOCATION(S) WITH ARCHITECT AND SIGNAGE PROVIDER PRIOR TO ROUGH-IN. COORDINATE FINAL POWER REQUIREMENTS WITH SIGNAGE PROVIDER PRIOR TO ROUGH-IN. PROVIDE LABEL AT SIGN LOCATION TO MEET NEC 600.6 REQUIREMENTS OF REMOTE DISCONNECITNG MEANS.
14	COORDINATE ALL POWER CONNECTIONS, DEVICES, BREAKERS, DISCONNECTS, ETC. IN THIS SPACE WITH OWNER AND EQUIPMENT PROVIDER (DSD) PRIOR TO PURCHASING OR ROUGH-IN OF ANY DEVICES FOR THIS SPACE. ALERT EOR IF REQUIREMENTS DIFFER FROM WHAT IS SHOWN ON PLANS.
15	ALL FIRE ALARM PANELS, BAS PANELS, ETC., SHALL HAVE HARDWIRED POWER AND DATA CONNECTION INSIDE THE ASSOCIATED ENCLOSURES.



1 **POWER FLOOR PLAN**
1/8" = 1'-0"

LIFE SAFETY PLAN LEGEND:

2 HOUR RATED WALL. UL U905 / U419

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

N TRUE NORTH

N PLAN NORTH

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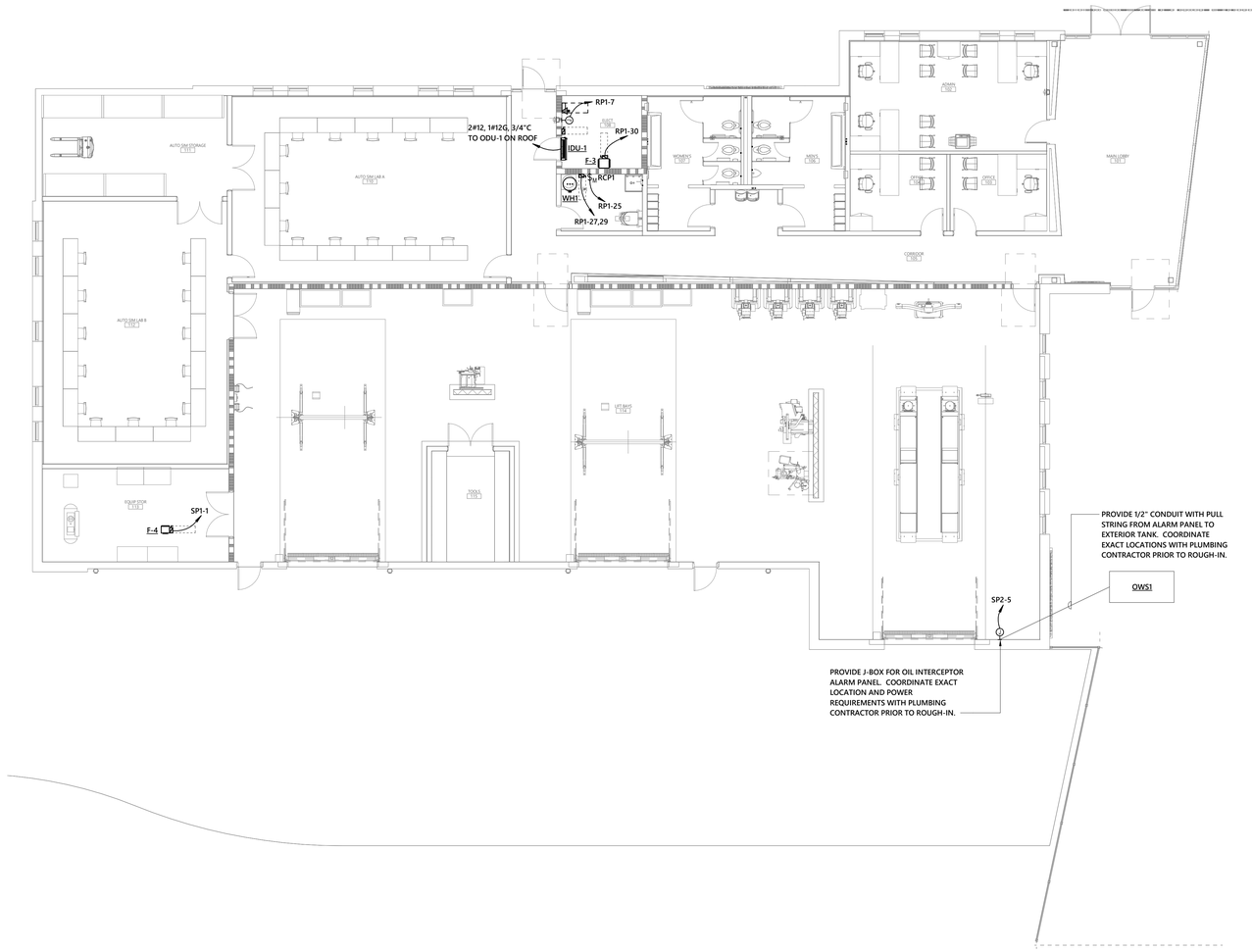
POWER FLOOR PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER

E201



1 EQUIPMENT CONNECTIONS FLOOR PLAN
1/8" = 1'-0"

LIFE SAFETY PLAN LEGEND:

2 HOUR RATED WALL. UL U905 / U419

N N

TRUE NORTH PLAN NORTH

0 5 10 20
SCALE: 1/8" = 1'-0"

Opt # 23-0128

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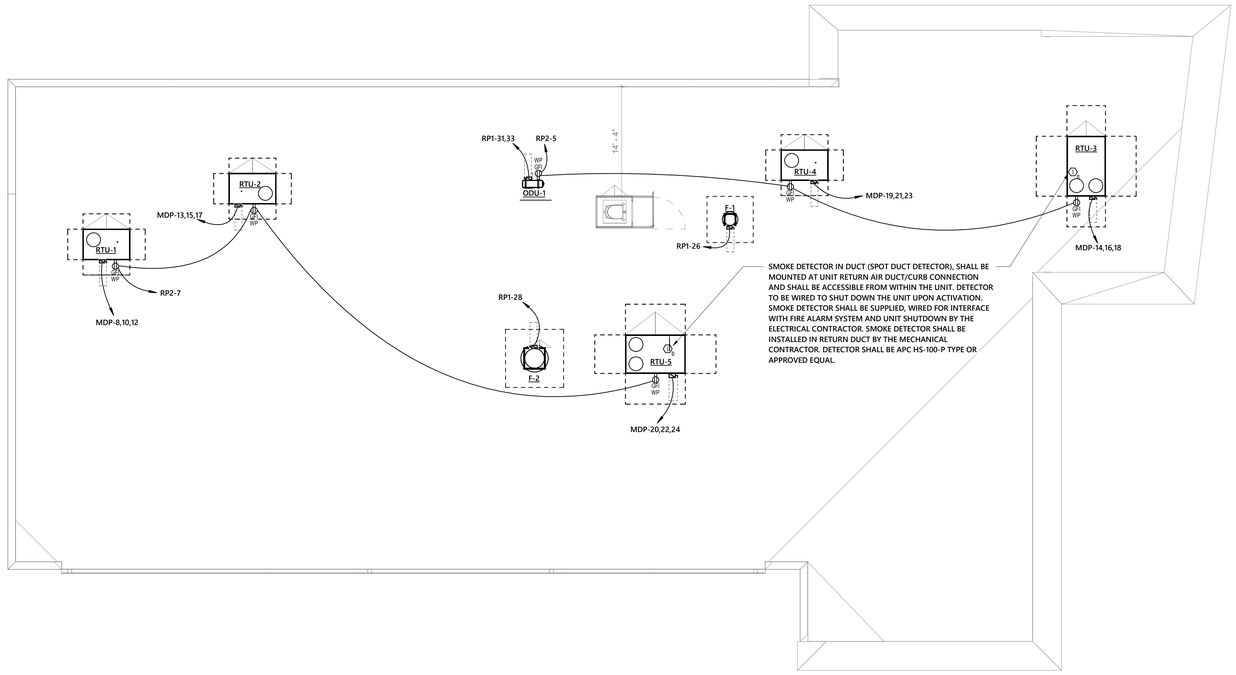
EQUIPMENT CONNECTIONS FLOOR PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER

E301



1 EQUIPMENT CONNECTIONS ROOF PLAN
1/8" = 1'-0"

N TRUE NORTH

N PLAN NORTH

0 5 10 20
SCALE: 1/8" = 1'=0"

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EQUIPMENT CONNECTIONS ROOF PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

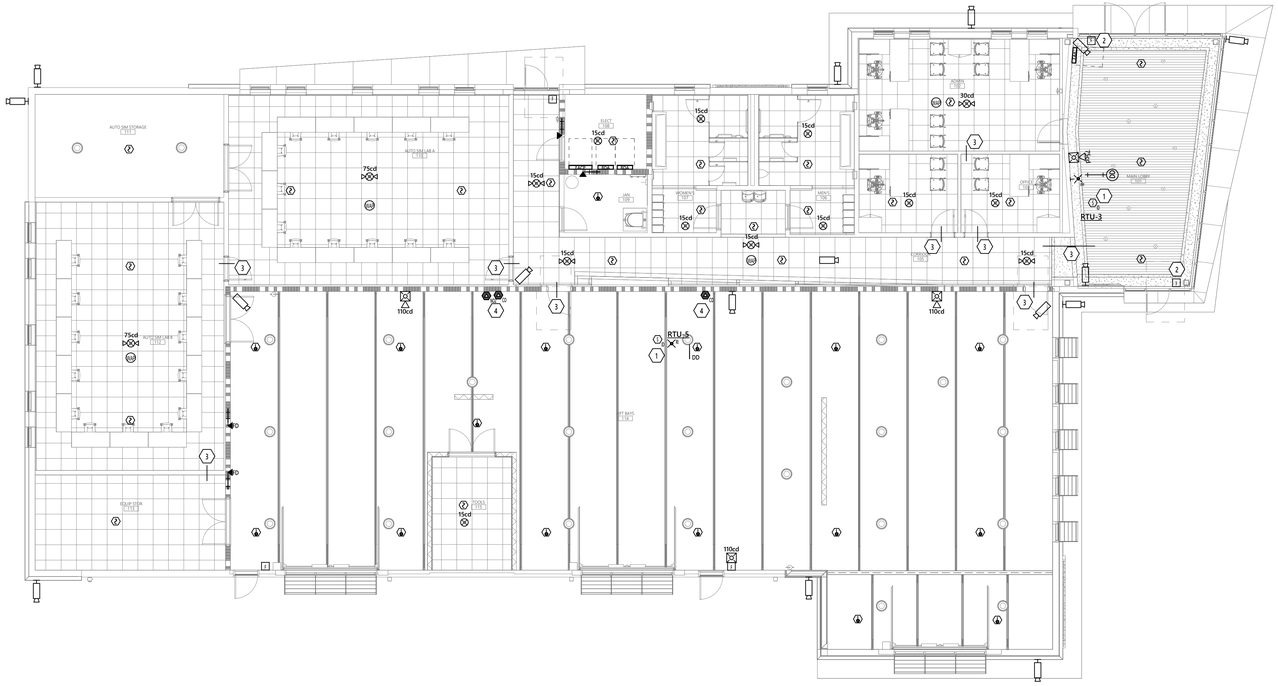
SHEET NUMBER
E302

General Notes_E - System

A.	ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING ALL ELECTRICAL ITEMS SHOWN ON THE DRAWINGS, EXCEPT ITEMS LISTED ON SHEET E0.01 GENERAL ELECTRICAL NOTES.
B.	ALL COMMUNICATIONS CABLES SHALL BE INSTALLED IN CONDUIT, CABLE TRAY, OR SUPPORTED BY CABLE HOOKS. PROVIDE BUSHINGS AT THE ENDS OF ALL CONDUIT WHERE STUBBED ABOVE ACCESSIBLE CEILINGS OR WHERE DROPPED INTO CABLE TRAY. PROVIDE CABLE HOOKS ABOVE ACCESSIBLE
C.	COORDINATE ALL SECURITY CAMERA LOCATIONS, HEIGHTS, AND DEVICE BOX REQUIREMENTS WITH OWNER PRIOR TO ROUOGH-IN.

KEYNOTES

#	Keynote Description
1	SMOKE DETECTOR IN DUCT (SPOT DUCT DETECTOR), SHALL BE MOUNTED AT UNIT RETURN AIR DUCT/CURB CONNECTION AND SHALL BE ACCESSIBLE FROM WITHIN THE UNIT. REFER TO E302 AND MECHANICAL PLANS FOR EXACT LOCATIONS.
2	PROVIDE MULLION MUNTED PULL STATION. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO ROUGH-IN.
3	PROVIDE 4" CONDUIT SLEEVE ABOVE CEILING SPACE FOR LOW VOLTAGE CABLES. COORDINATE EXACT CONDUIT SLEEVE LOCATION AND HEIGHT WITH OWNER PRIOR TO ROUGH-IN. CONDUIT SLEEVES SHALL BE CAPPED OFF IF EMPTY OR IF OPEN, SHALL BE SEALED.
4	STANDALONE CO/NO2 SYSTEM NOT CONNECTED TO FIRE ALARM SYSTEM. SHALL BE INTERCONNECTED WITH FAN F-2. PROVIDED AND INSTALLED BY MECHANICAL CONTRACTOR. SHOWN FOR REFRENCE ONLY.



1 SYSTEMS REFLECTED CEILING PLAN
1/8" = 1'-0"

LIFE SAFETY PLAN LEGEND:

2 HOUR RATED WALL, UL U905 / U419

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

TRUE NORTH

PLAN NORTH

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SPECIAL SYSTEMS FLOOR PLAN

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS

NO:	DATE:	DESCRIPTION:

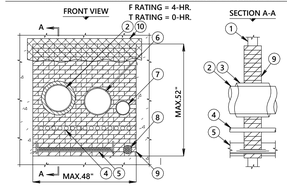
SHEET NUMBER

E401

U.L. SYSTEM NO. WJ8007
MULTIPLE PENETRATING ITEMS THROUGH CONCRETE FLOOR OR WALL

F RATING = 4-HR.
T RATING = 0-HR.

FRONT VIEW



SECTION A-A

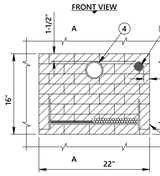
1. CONCRETE FLOOR OR WALL ASSEMBLY (MINIMUM 4-1/2" THICK).
2. MAXIMUM 12" DIAMETER STEEL PIPE OR MAXIMUM 6" DIAMETER COPPER PIPE.
3. MAXIMUM 1-1/2" THICK GLASS-FIBER PIPE INSULATION.
4. 1-1/2" DIAMETER STEEL CONDUIT (MAXIMUM QUANTITY = 15).
5. STEEL OR ALUMINUM CABLE TRAY (MAXIMUM SIZE : 36" x 6") WITH ANY OF THE FOLLOWING TYPES OF CABLE MAY BE USED WITH MAXIMUM 30% FILL OF CABLE TRAY :
   A. MAXIMUM 500 KCMIL SINGLE CONDUCTOR POWER CABLE.
   B. MAXIMUM 7/C NO. 12 AWG COPPER CONDUCTOR CABLE.
   C. MAXIMUM 300 PAIR NO. 24 AWG TELEPHONE CABLES.
6. MAXIMUM 30" DIAMETER STEEL PIPE (12" DIAMETER PIPE SHOWN).
7. 6" DIAMETER STEEL PIPE.
8. MAXIMUM 4" DIAMETER CABLE BUNDLE TO INCLUDE ANY OF THE FOLLOWING :
   A. FIBER-OPTIC CABLE (MAX. 1/2" DIA).
   B. ROMEX (2/C NO. 10 +GROUND) CABLES.
   C. 25 PAIR NO. 24 AWG TELEPHONE CABLES.
   D. 7/C NO. 12 AWG COPPER CONDUCTOR.
   E. RG 62A COAXIAL CABLES.
   F. METAL CLAD CABLE (MAX. 3/4" DIA.).
9. INTUMESCENT FIRESTOP BLOCK (2" TALL x 5" WIDE x 8" DEEP, REF: FRONT VIEW).
10. SEE NOTE NO. 4 BELOW.

NOTES :
1. ANNULAR SPACING FOR CABLE TRAY = MINIMUM 1-1/2".
2. ANNULAR SPACING FOR PIPE AND CABLE PENETRATIONS = MINIMUM 1".
3. INSTALL HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT IN ANY VOID THAT MAY EXIST (AROUND CABLE TRAY, CABLES OR PIPE PENETRATIONS).
4. IF THE ANNULAR SPACE IS GREATER THAN 5", PROVIDE A STEEL WIRE MESH (NOMINAL 2" SQUARES, NO. 16 SWG., INSTALL ON EACH SIDE OF WALL ASSEMBLY.
5. MAXIMUM AREA OF OPENING = 2496 SQUARE INCHES.

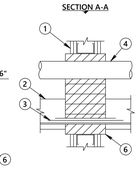
U.L. SYSTEM NO. WL8013
MULTIPLE PENETRATIONS THROUGH 1-HR. OR 2-HR. GYPSUM WALL

F RATING = 1-HR. OR 2-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = 5 CFM/SQ. FT.
L RATING AT 400°F = 2 CFM/SQ. FT.

FRONT VIEW



SECTION A-A



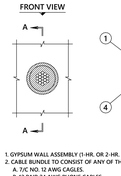
1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. STEEL OR ALUMINUM CABLE TRAY (MAXIMUM SIZE : 18" x 4").
3. ANY OF THE FOLLOWING TYPES OF CABLE MAY BE USED WITH MAX. 30% FILL ON CABLE TRAY :
   A. 500 KCMIL SINGLE CONDUCTOR POWER CABLE.
   B. 7/C NO. 12 AWG COPPER CONDUCTOR CABLE.
   C. 300 PAIR NO. 24 AWG TELEPHONE CABLE.
4. MAXIMUM 3" DIAMETER PVC PLASTIC PIPE (SCHEDULE 40)(CLOSED OR VENTED PIPING SYSTEM).
5. CABLE BUNDLE (MAX. 2" DIA.) TO CONSIST OF ANY OF THE FOLLOWING:
   A. FIBER-OPTIC CABLE.
   B. RG 59 COAXIAL CABLE.
   C. 25 PAIR NO. 24 AWG TELEPHONE CABLE.
   D. 7/C NO. 12 AWG COPPER CONDUCTOR.
6. FIRESTOP BLOCKS (2" x 5" x 8" DEEP, REF: FRONT VIEW).

NOTES :
1. NOT SHOWN: PENETRATING ITEMS MAY ALSO INCLUDE A MAX. 4" DIA. STEEL OR COPPER PIPE, EMT, OR STEEL CONDUIT WITH A MAX. 1-1/2" GLASS-FIBER PIPE INSULATION OR NON-INSULATED MAX. 4" STEEL PIPE, EMT, OR CONDUIT.
2. ANNULAR SPACE = MINIMUM 1".
3. INSTALL HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT IN ANY VOID THAT MAY EXIST (AROUND PENETRATING ITEMS, OR BETWEEN BLOCKS).

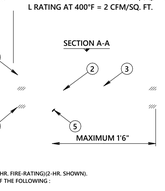
U.L. SYSTEM NO. WL3065
CABLE BUNDLE THROUGH 1-HR. OR 2-HR. FIRE-RATED GYPSUM WALL

F RATING = 1-HR. OR 2-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = 5 CFM/SQ. FT.
L RATING AT 400°F = 2 CFM/SQ. FT.

FRONT VIEW



SECTION A-A



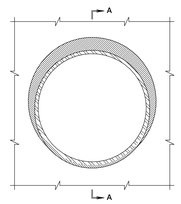
1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. CABLE BUNDLE TO CONSIST OF ANY OF THE FOLLOWING :
   A. 7/C NO. 12 AWG CABLES.
   B. 12 PAIR 24 AWG PHONE CABLES.
   C. 25 PAIR 24 AWG PHONE CABLES.
   D. RG 59 COAXIAL CABLES.
   E. 2/C (+GND) NO. 14 AWG METAL-CLAD CABLES.
   F. 2/C NO. 8 AWG METAL-CLAD CABLES.
   G. MAXIMUM 1/2" DIAMETER FIBER-OPTIC CABLES.
3. OPTIONAL : MAX. 4" NOM. DIA. STEEL PIPE SLEEVE (SCH. 40 OR THINNER)(SEE NOTE NO. 4).
4. HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT :
   A. MINIMUM 5/8" DEPTH OF SEALANT FOR A 1-HR. FIRE-RATING.
   B. MINIMUM 1-1/4" DEPTH OF SEALANT FOR A 2-HR. FIRE-RATING.
5. SEE NOTE NO. 4 BELOW.

NOTES :
1. MAXIMUM DIAMETER OF OPENING = 4-1/2".
2. CABLES TO FILL MAXIMUM 33% OF AREA OF OPENING.
3. ANNULAR SPACE = MINIMUM 1/4", MAXIMUM 3/4".
4. STEEL SLEEVE MAY BE FLUSH WITH WALL SURFACE OR EXTEND UP TO 18" BEYOND WALL SURFACE IN ANY COMBINATION. WHEN SLEEVE IS FLUSH WITH WALL, APPLY FIRESTOP SEALANT ONTO WALL SURFACE. WHEN SLEEVE IS EXTENDED BEYOND ONE OR BOTH SIDES OF WALL, APPLY 1/2" CROWN FIRESTOP SEALANT TO WALL/SLEEVE INTERFACE.

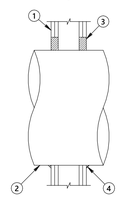
U.L. SYSTEM NO. WL1054
METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATING = 1-HR. OR 2-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = LESS THAN 4 CFM/SQ. FT.

FRONT VIEW



SECTION A-A



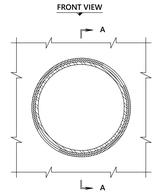
1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 30" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER STEEL EMT.
3. HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT :
   A. MINIMUM 5/8" DEPTH OF SEALANT FOR A 1-HR. FIRE-RATING.
   B. MINIMUM 1-1/4" DEPTH OF SEALANT FOR A 2-HR. FIRE-RATING.
4. MINIMUM 1/2" BEAD HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

NOTES :
1. MAXIMUM DIAMETER OF OPENING = 32-1/4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 3-1/4".

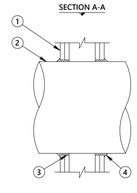
U.L. SYSTEM NO. WL1085
EMT THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY

F RATING = 1-HR. AND 2-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.

FRONT VIEW



SECTION A-A



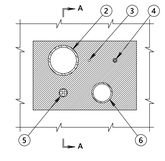
1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 12" DIAMETER STEEL PIPE (SCHEDULE 20 OR HEAVIER).
   B. MAXIMUM 12" DIAMETER CAST IRON PIPE.
   C. MAXIMUM 6" DIAMETER COPPER PIPE.
   D. MAXIMUM 6" DIAMETER EMT.
   E. MAXIMUM 6" DIAMETER STEEL CONDUIT.
3. HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT FORCED INTO ANNULAR SPACE TO MAXIMUM EXTENT.
4. MINIMUM 1/2" BEAD HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT AT PIPE/GYPSUM WALLBOARD INTERFACE.

NOTE : ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/4".

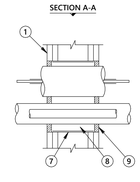
U.L. SYSTEM NO. WL8004
MULTIPLE METAL PIPE AND CABLE THROUGH 2-HR. GYPSUM WALL

F RATING = 2-HR.
T RATING = 1/4-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.

FRONT VIEW

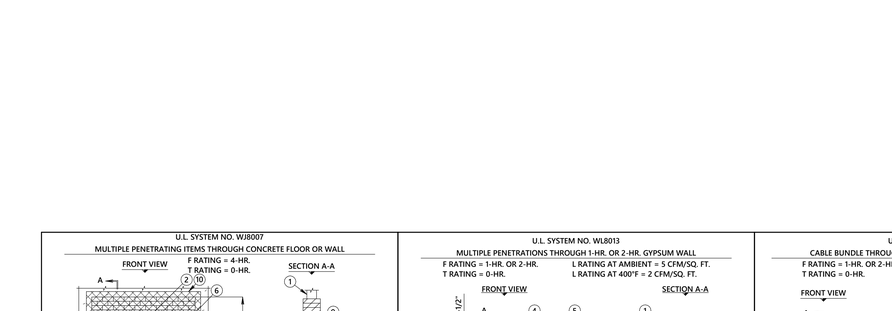


SECTION A-A



1. GYPSUM WALL ASSEMBLY (2-HR. FIRE-RATING).
2. MAXIMUM 3" DIAMETER ELECTRICAL METALLIC TUBING (EMT).
3. MAXIMUM 25 PAIR NO. 24 AWG (OR SMALLER) TELEPHONE CABLES.
4. MAXIMUM 3/C NO. 10 AWG NM (WITH GROUND) POWER CABLE WITH PVC INSULATION.
5. MAXIMUM 300 KCMIL (OR SMALLER) POWER CABLE WITH PVC INSULATION & NYLON JACKET.
6. MAXIMUM 2" DIAMETER STEEL PIPE, COPPER PIPE, EMT, OR STEEL CONDUIT.
7. NO. 8 STEEL WIRE MESH, 4-1/4" LONG (OR STANDARD METAL DRYWALL TRACK SCREWED SECURELY IN PLACE) CENTERED IN OPENING.
8. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
9. MIN. 1/2" DEPTH HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT.

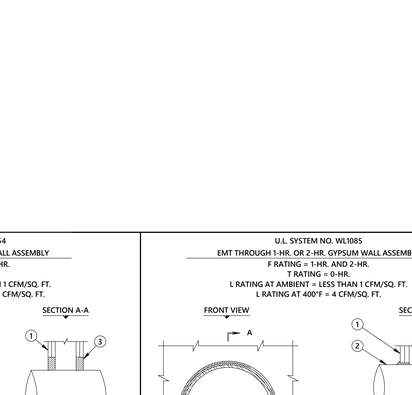
NOTES :
1. MAXIMUM AREA OF OPENING = 96 SQUARE INCHES WITH A MAX. DIM. OF 12".
2. DISTANCE BETWEEN ITEMS = MINIMUM 1-3/4", MAXIMUM 7".
3. DISTANCE FROM EDGE OF OPENING = MINIMUM 1/2", MAXIMUM 7". (EXCEPTION: 300 KCMIL POWER CABLE MUST BE MINIMUM 1-1/2" FROM EDGE OF OPENING.



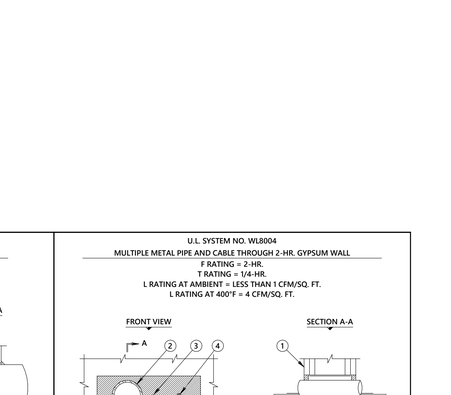
NOTES:
1. LOCATIONS WHERE TV MOUNT IS BACK TO BACK ON SAME WALL, AN OFFSET OF 8-12" WILL BE NEEDED FOR INSTALLATION OF JACK/RECEPTACLE.
2. DEVICES ABOVE COUNTER TOPS SHALL BE A MAXIMUM OF 48" TO TOP OF DEVICE.
3. DEVICES NEXT TO DOOR EXIT SHALL BE WITHIN 8" (MAXIMUM) TYPICAL OF DOOR UNLESS OBSTACLES SUCH AS SIDELITES, ETC.
4. DEVICES REQUIRED TO BE ADA ACCESSIBLE SHALL BE INSTALLED PER ANSI A117.1.
5. ALL METALLIC & NON-METALLIC, SWITCH AND RECEPTACLE BOXES INSTALLED IN FIRE RATED FRAME WALLS SHALL INCLUDE APPROVED FIRESTOP PUTTY PADS APPPLIED ON THE BACK AND ALL SIDES OF BOX NOT TOUCHING THE WOOD STUD.
6. IN THE CIRCULATION PATH, IF THERE ARE PENDANT LIGHT FIXTURES, ENSURE THEY ARE LOCATED 80" A.F.F. OR HIGHER UNLESS LOCATED ABOVE A FIXED ELEMENT. WALL MOUNTED FIXTURES LOCATED 27" AND 80" A.F.F. SHALL NOT EXTEND GREATER THAN 4" FROM WALL OR BASE OR HAVE FIXED PROTECTION AT 27" A.F.F. OR LOWER WHEN THESE ELEMENTS ARE LOCATED IN THE CIRCULATION PATH.
7. LOW EXIT SIGN AS INDICATED ON PLANS. PER IBC 1011.2.

1 MOUNTING HEIGHTS OF DEVICES - ELEVATION
NOT TO SCALE

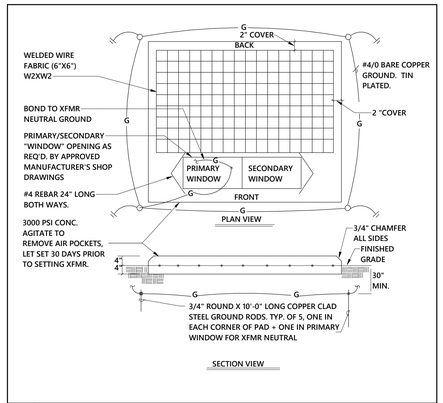
2 ROOF PENETRATION DIAGRAM
NOT TO SCALE



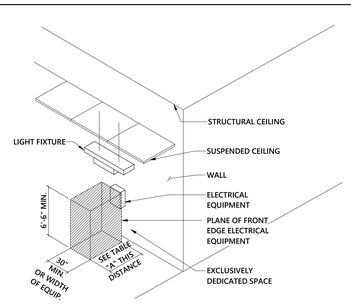
3 CONDUIT TRANSITION DETAIL
NO SCALE



4 SERVICE GROUND DIAGRAM
NOT TO SCALE



5 TRANSFORMER PAD DETAIL
NOT TO SCALE



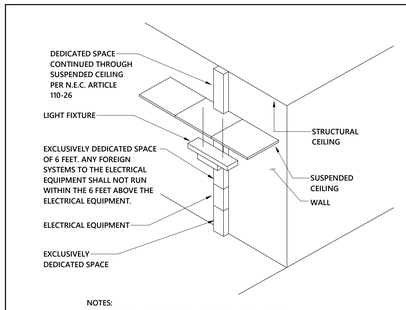
NOTES:
THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF THE ELECTRICAL EQUIPMENT REQUIRED BY SECTION 110-26 OF THE NATIONAL ELECTRICAL CODE.

TABLE A - WORKING CLEARANCES			
VOLTAGE TO GROUND NOMINAL	MINIMUM CLEAR DISTANCE (FEET) CONDITION: 1	2	3
0 - 150	3	3	3
151 - 600	3	3 1/2	4

WHERE THE "CONDITIONS" ARE AS FOLLOWS:

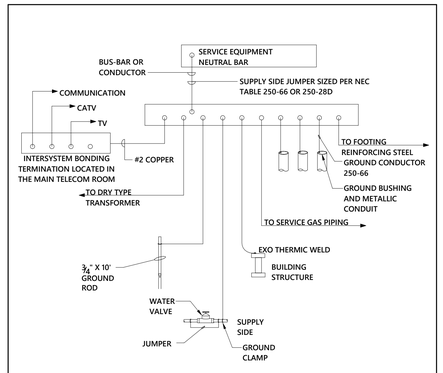
1. EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED BUSBARS OPERATING AT NOT OVER 300V SHALL NOT BE CONSIDERED LIVE PARTS.
2. EXPOSED LIVE PARTS ON ONE SIDE AND GROUNDED PARTS ON THE OTHER SIDE.
3. EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.

6 WORKING CLEARANCE FOR ELECTRICAL EQUIPMENT
NO SCALE



NOTES:
THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRED OVER AND UNDER THE ELECTRICAL EQUIPMENT FOR THE CABLES, RACEWAYS, ETC., TO AND FROM THE ELECTRICAL EQUIPMENT REQUIRED BY SECTION 11-26 OF THE NATIONAL ELECTRICAL CODE.

7 DEDICATED SPACE FOR ELECTRICAL EQUIPMENT
NO SCALE



8 SERVICE EQUIPMENT GROUNDING DIAGRAM
NO SCALE

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3/3/25

RICHMOND COMMUNITY COLLEGE HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 Hamlet Ave,
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BID DOCUMENTS

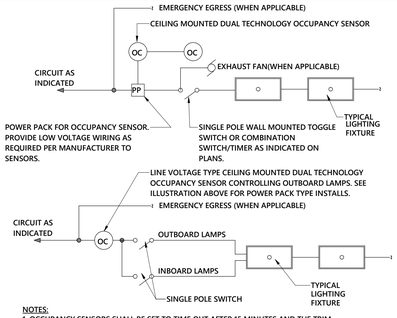
ELECTRICAL DETAILS - PENETRATIONS & GENERAL

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

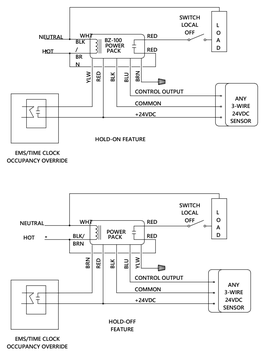
SHEET NUMBER

E601



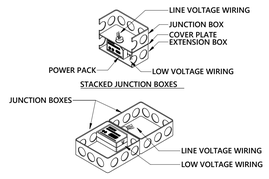
NOTES:
1. OCCUPANCY SENSORS SHALL BE SET TO TIME OUT AFTER 15 MINUTES AND THE TRIM POTENTIOMETER IS SET TO 90% FOR SENSITIVITY.
2. OCCUPANCY SENSORS SHALL BE PLACED AS TO NOT FUNCTION UPON SOMEONE JUST PASSING BY THE ROOM DOOR BUT BY ACTUALLY ENTERING THE ROOM IN AS MUCH AS POSSIBLE.

1 TYPICAL CEILING MOUNTED OCCUPANCY SENSOR WIRING DIAGRAMS
NOT TO SCALE



NOTE: CONNECT ONLY THE SUPPLY FOR THE VOLTAGE BEING USED. CAP UNUSED POWER SUPPLY WIRE.

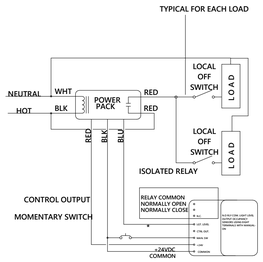
2 POWER PACK WIRING DIAGRAM
NOT TO SCALE



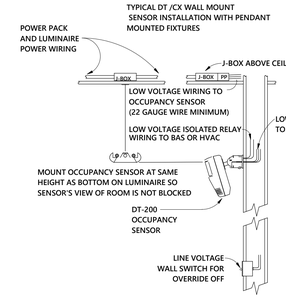
NOTE:
DO NOT MOUNT POWER PACKS CLOSER THAN 6-12 INCHES FROM SENSOR. PROVIDE DOUBLE STACKED JUNCTION BOX FOR MAXIMUM VENTILATION OF POWER PACK. PROVIDE BLANK COVER. WHERE PERMITTED BY CODE AND AHJ, LEAVE (2) OPENINGS IN CONDUIT KNOCKOUT FOR VENTING OF POWER PACK. VERIFY WITH AHJ PRIOR TO KNOCKOUT REMOVAL.

POWER PACK INSTALLED IN J-BOX

3 POWER PACK INSTALLATION
NOT TO SCALE

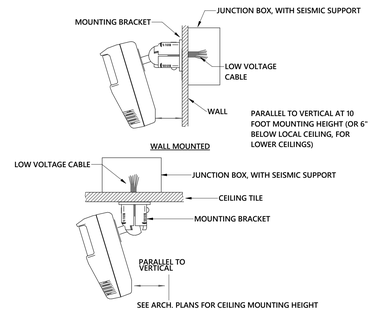


4 DT-200-300
NOT TO SCALE



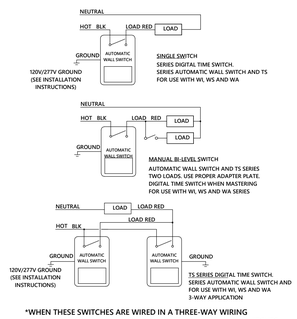
DT-200/CX SERIES MOUNTING DETAIL WITH PENDANT MOUNTED FIXTURES

5 DT-200 PENDANT FIXTURE
NOT TO SCALE



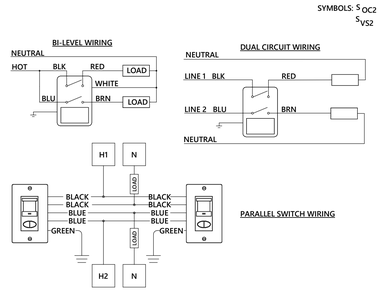
NOTES:
1. TILT SENSOR TOWARD CENTER OF ROOM FOR MAXIMUM EFFECTIVENESS.
2. CALIBRATE SENSITIVITY AND DIRECTION AFTER INSTALLATION.
3. PROVIDE WALL MOUNT BRACKET AND INSTALL AT CORNER MOST SECTION OF ROOM. PATTERN IS BASED ON CONICAL SHAPE.

6 CORNER MOUNT SENSOR
NOT TO SCALE



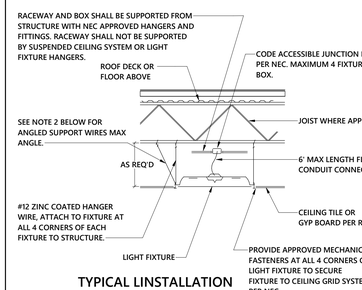
*WHEN THESE SWITCHES ARE WIRED IN A THREE-WAY WIRING CONFIGURATION THEY WILL ONLY OPERATE AS THREE-WAY SWITCHES IF THEY ARE LEFT IN AUTOMATIC MODE. IF ONE SWITCH IS TURNED OFF, THE LIGHTS WILL NOT COME AUTOMATICALLY ON UNTIL THAT SWITCH IS TURN BACK TO THE AUTOMATIC POSITION.

7 SINGLE POLE OCC. SENSOR SWITCH
NOT TO SCALE

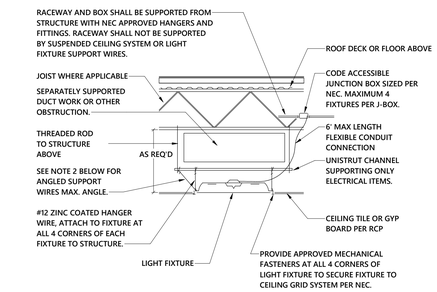


NOTES:
1. COLOR CODING AND WIRING MAY VARY PER MANUFACTURER.
2. IF SEQUENCE OF OPERATION PROVIDED, SEE SEQUENCE FOR SETTING REQUIREMENTS. OTHERWISE SET TIME AFTER NO OCCUPANCY DETECTED FOR 15 MINUTES.
3. OCCUPANCY AND/OR VACANCY SENSORS APPLY.
4. BOTH SENSORS MUST TIME OUT FOR LIGHTS TO TURN OFF.
5. SWITCHING IS LINE VOLTAGE.
6. WHEN REQUIRED CONNECT NEUTRAL TO WHITE LEAD (NEUTRAL OF SWITCH).

8 DUAL RELAY WALL SWITCH SENSORS
NOT TO SCALE



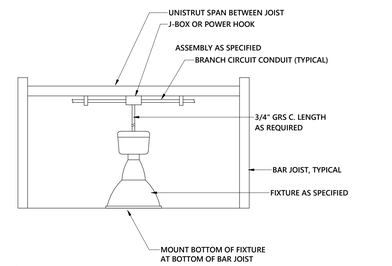
TYPICAL LINSTALLATION



INSTALLATION WITH OBSTRUCTION ABOVE

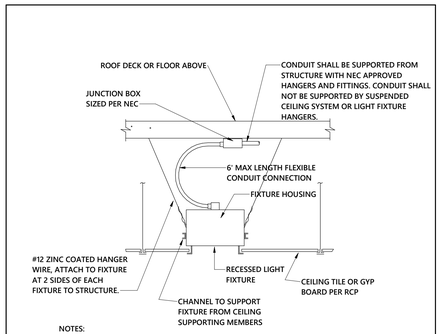
NOTES:
1. WHERE ROOF DECKING IS THE IS THE ALLOWABLE SUPPORT STRUCTURE, AND PATHWAY SYSTEM IS NOT IMC OR RMC, THE MINIMUM DISTANCE FROM ROOF DECKING SHALL BE 1.5" FOR ALL BOXES AND CONUIT.
2. WHERE WIRE IS USED FOR SUPPORT THE SYSTEM SHALL MEET ASTM C636 FOR CONNECTIONS AND ANGLE OF WIRES. USE #12 GAUGE HANGER WIRE, THREE TIGHT FULL TURNS WITHIN 3" AT EACH END, AND NO MORE THAN A 1:6 ANGLE OUT OF PLUMB. SUPPORTS SHALL BE TO STRUCTURE ABOVE NOT ADJACENT WALLS.

9 TYPICAL LAY-IN FIXTURE AND SUPPORT BELOW STRUCTURE DIAGRAM
NOT TO SCALE



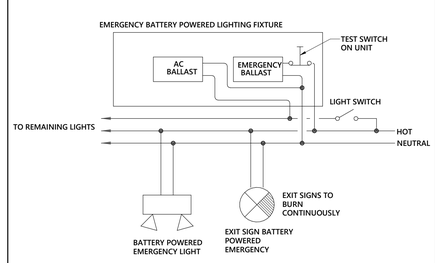
NOTES:
1. ORIENTATION SHOWN IS FOR PERPENDICULAR TO FLOOR APPLICATIONS. FOR SLOPED JOIST INSTALLATION, MATCH SLOPE OF JOIST AND MOUNT FLUSH WITH JOIST. ADJUST UNISTRUT AS REQUIRED.
2. EXPOSED CONDUIT SHALL BE PAINTED TO MATCH LOCAL AREA.

10 HI-BAY FIXTURE PENDANT
NOT TO SCALE

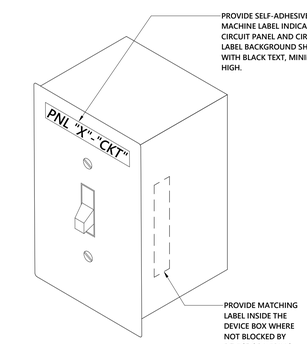


NOTES:
1. WHERE ROOF DECKING IS THE IS THE ALLOWABLE SUPPORT STRUCTURE, AND PATHWAY SYSTEM IS NOT IMC OR RMC, THE MINIMUM DISTANCE FROM ROOF DECKING SHALL BE 1.5" FOR ALL BOXES AND CONDUIT.

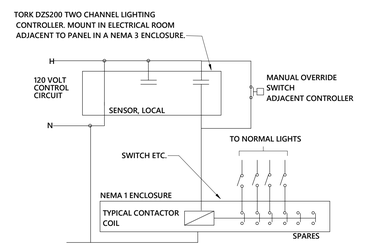
11 TYPICAL RECESSED DOWN LIGHT FIXTURE INSTALLATION DIAGRAM
NOT TO SCALE



12 SWITCHED EMERGENCY LIGHTING DIAGRAM-1
NOT TO SCALE



13 SWITCH PLATE AND BOX LABELING
NO SCALE



CONTACTOR	COIL VOLTAGE	POLES	CIRCUITS SWITCHED	ZONE DESCRIPTION
LC1	120	*3*	*RP1-10, RP1-12, RP1-14*	*BUILDING SIGNAGE*
LC2	277	*1*	*MDP-30*	*EXTERIOR BUILDING LIGHTING*

NOTE: EMERGENCY FIXTURES SHALL HAVE "AVAILABLE" POWER AT ALL TIMES.

14 LIGHTING CONTACTOR DETAIL W-TIMER
NOT TO SCALE

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BID DOCUMENTS

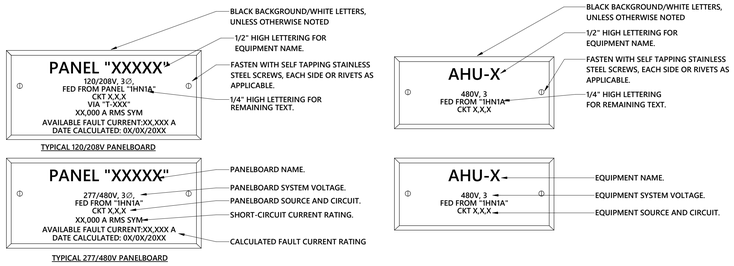
ELECTRICAL DETAILS - LIGHTING

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
E602

Opt # 23-0128

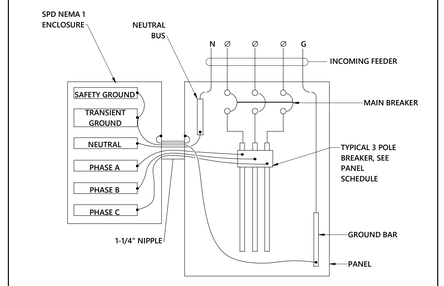


PANELBOARD NAMEPLATES

EQUIPMENT NAMEPLATES

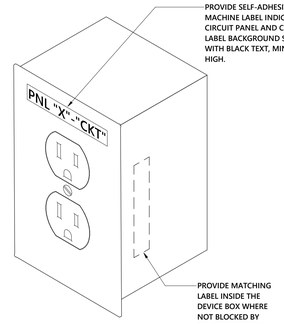
NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, COLORS, ETC.
2. PROVIDE SHORT-CIRCUIT CURRENT RATING AND AVAILABLE FAULT CURRENT ON EACH NON-DWELLING SERVICE EQUIPMENT NAMEPLATE.

1 TYPICAL NAMEPLATE DIAGRAM
NOT TO SCALE

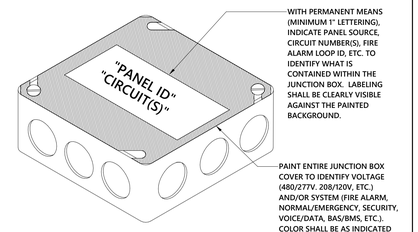


NOTES:
1. ALL WIRING SHALL BE #6 AWG.
2. AVOID SHARP BENDS IN WIRES. ALL WIRE LENGTHS SHALL NOT EXCEED 18" (WHERE POSSIBLE).
3. SEE SPD SPECIFICATION FOR EXACT TYPE FOR LOCATION AS INDICATED ON THE POWER RISER DIAGRAM.

2 SPD CONNECTION DETAIL
NOT TO SCALE

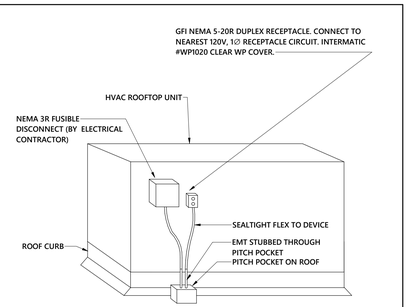


3 RECEPTACLE PLATE AND BOX LABELING
NO SCALE



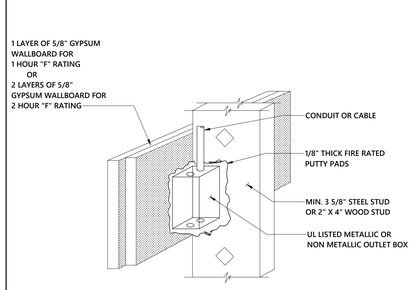
NOTES:
1. ALL JUNCTION BOXES SHALL BE ACCESSIBLE.
2. THE LABELING/IDENTIFICATION INDICATED ABOVE IS INTENDED FOR ALL JUNCTION BOXES EXCEPT AS INDICATED IN NOTE 3.
3. LABELING/IDENTIFICATION FOR JUNCTION BOXES WHICH ARE VISIBLE IN FINISHED SPACES SHALL BE SIMILAR TO ABOVE EXCEPT THE LABELING/IDENTIFICATION SHALL BE LOCATED ON THE INSIDE COVER OF THE JUNCTION BOX.

4 JUNCTION BOX LABELING/IDENTIFICATION
NO SCALE



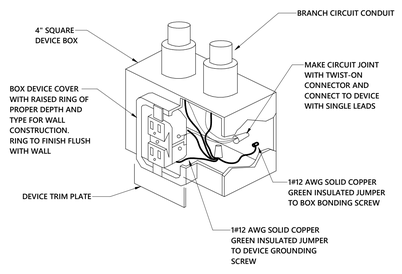
NOTE: TYPICAL FOR ROOF MOUNTED HVAC EQUIPMENT.

5 ROOFTOP RECEPTACLE DETAIL
NOT TO SCALE

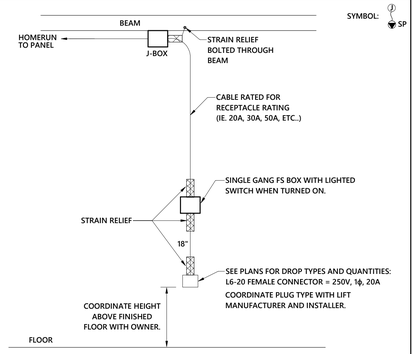


NOTES:
1. REQUIRED FOR METALLIC AND NON-METALLIC ELECTRICAL BOXES EXCEEDING 16 SQ. INCHES IN AREA OR MULTIPLE BOXES SERVING SAME SPACE.
2. REQUIRED FOR BACK TO BACK BOXES IN THE SAME STUD CAVITY.
3. REQUIRED FOR BOXES EXCEEDING 100 SQ INCHES TOTAL IN 100 SQ FEET OF WALL AREA.
4. THE USE OF PUTTY PADS ADHERENCE IS AT THE DISCRETION OF THE LOCAL AUTHORITY HAVING JURISDICTION.
5. REFER TO UL LISTING OF WALL FOR ADDITIONAL RESTRICTIONS OR INFORMATION.

6 WALL OUTLET DETAIL
NOT TO SCALE

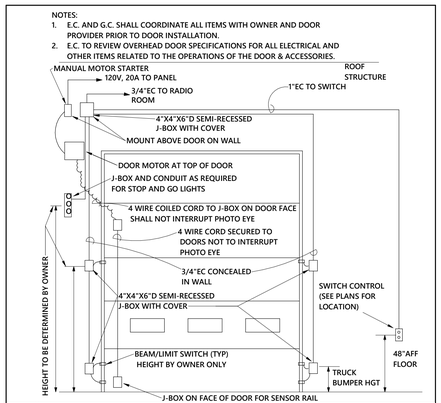


7 RECEPTACLE GROUNDING DETAIL
NO SCALE



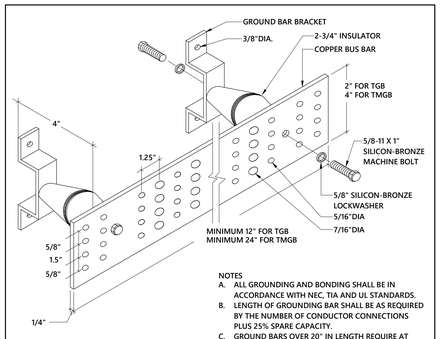
NOTES:
1. COORDINATE CONSTRUCTION AND SIZE OF OF DROPS WITH OWNER AND OWNERS EQUIPMENT.
2. COORDINATE EXACT LOCATIONS WITH OWNER.

8 SHORE POWER DROPS DETAIL - SPECIAL RECEPTACLE
NO SCALE



NOTES:
1. E.C. AND G.C. SHALL COORDINATE ALL ITEMS WITH OWNER AND DOOR PROVIDER PRIOR TO DOOR INSTALLATION.
2. E.C. TO REVIEW OVERHEAD DOOR SPECIFICATIONS FOR ALL ELECTRICAL AND OTHER ITEMS RELATED TO THE OPERATIONS OF THE DOOR & ACCESSORIES.

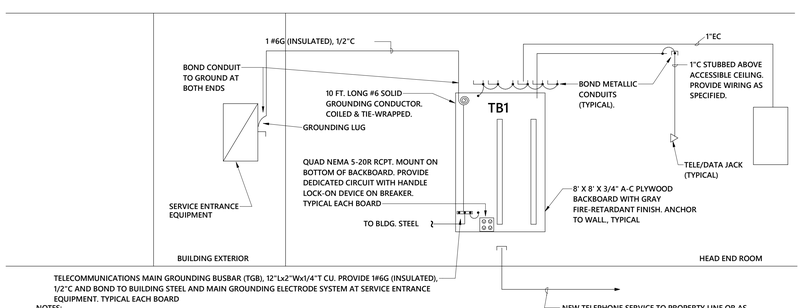
9 APPARATUS BAY ROLLING DOOR DETAIL
NOT TO SCALE



NOTES
A. ALL GROUNDING AND BONDING SHALL BE IN ACCORDANCE WITH NEC, TIA AND UL STANDARDS.
B. LENGTH OF GROUNDING BAR SHALL BE AS REQUIRED BY THE NUMBER OF CONDUCTOR CONNECTIONS PLUS 25% SPARE CAPACITY.
C. GROUND BARS OVER 20" IN LENGTH REQUIRE AT LEAST ONE ADDITIONAL INSULATOR SUPPORT.
D. MOUNT GROUND BAR AT 6'-8" AFF UNLESS OTHERWISE DIRECTED BY OWNER.

TGB
TMGB

10 TELECOMMUNICATIONS GROUNDING BAR DETAIL
NO SCALE

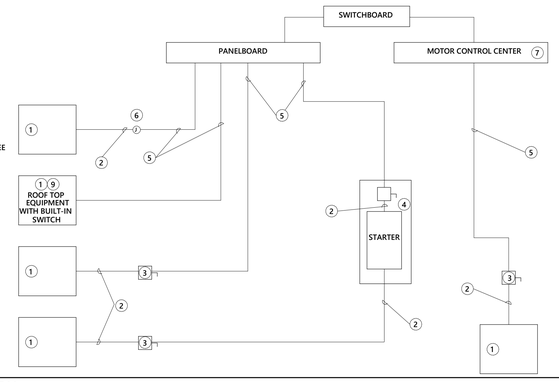


NOTES:
1. FLOOR PLANS INDICATE THE EXACT QUANTITY AND LOCATION OF ALL TELEPHONE OUTLETS.
2. SEE PLANS FOR HEAD END LOCATION, AND DISTRIBUTION CLOSETS.
3. METALLIC CONDUIT TO AND FROM CABLE TRAY SHALL BE GROUNDED PER NEC 392.
4. SEE SITE PLAN FOR ALL SERVICE ENTRANCE CONDUIT.

11 TELECOMMUNICATIONS RISER DIAGRAM
NOT TO SCALE

ELECTRICAL NOTES:

1. EQUIPMENT OF TRADES OTHER THAN ELECTRICAL
2. CONDUIT AND WIRING BY HVAC PLUMBING CONTRACTOR OR OTHER TRADES.
3. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC, IT SHALL BE PROVIDED AND INSTALLED BY THE EQUIPMENT CONTRACTOR.
4. A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER LOCATE ADJACENT TO EQUIPMENT.
5. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
6. JUNCTION BOX MAY BE SHOWN ON ELECTRICAL PLANS FOR SOME EQUIPMENT. A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX. LOAD SIDE WIRING WILL BE PROVIDED BY MECHANICAL CONTRACTOR OR OTHER TRADES.
7. PROJECTS UTILIZING AN MCC. THE STARTER, CB, OR VFD IN THE MCC ARE PROVIDED BY THE ELECTRICAL CONTRACTOR.
8. IN ALL CASES THE EQUIPMENT CONTRACTOR SHALL MAKE FINAL CONNECTIONS STARTUP, AND TEST EQUIPMENT.
9. IF THE ROOF TOP EQUIPMENT IS NOT PROVIDED WITH BUILT IN SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL DISCONNECT SWITCH



12 ELECTRICAL EQUIPMENT CONNECTION
NO SCALE

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3/3/25

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BID DOCUMENTS

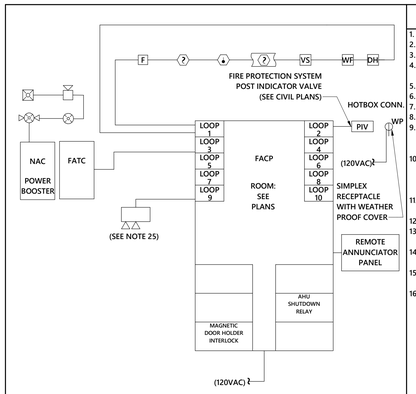
ELECTRICAL DETAILS - POWER

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
E603

Opt # 23-0128



1 FIRE ALARM RISER DIAGRAM
NOT TO SCALE

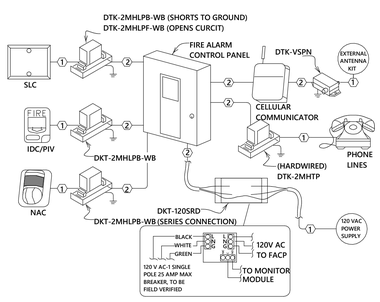
FIRE ALARM NOTES

1. FACP SHALL HAVE A MINIMUM 60HR. BATTERY BACKUP.
2. FACP SHALL BE FULLY ANALOG ADDRESSABLE.
3. FACP SHALL BE CONNECTED TO A UL APPROVED CENTRAL STATION.
4. ZONE PER NFPA 72, 2013 AND MANUFACTURER'S RECOMMENDATIONS WITH NO ONE ZONE EXCEEDING 15,000 S.F. PER FLOOR.
5. COORDINATE QUANTITY AND LOCATIONS OF DEVICES WITH CONTRACT DRAWINGS.
6. LOCATE SMOKE DETECTOR WITHIN 5' OF THE MAGNETIC HOLD OPEN DOORS. (TYPICAL)
7. LOCATE FIRE ALARM PULL STATION WITHIN 5' OF THE EXIT DOOR.
8. LOCATE SMOKE/HEAT DETECTOR WITHIN 5' OF THE FA EQUIPMENT (FACP, FATC, NAC).
9. LOCATION OF CEILING MOUNTED SMOKE/HEAT DETECTOR SHALL BE FIELD COORDINATED PRIOR TO ROUGH IN. THE DETECTOR SHALL BE A MINIMUM OF 2' AWAY FROM LIGHT FIXTURE AND A MINIMUM OF 3' AWAY FROM AIR DISTRIBUTION DEVICES.
10. AUTOMATIC DOOR CLOSING SHALL BE ACCOMPLISHED BY THE ACTIVATION OF THE BUILDING FIRE ALARM SYSTEM. SMOKE DETECTOR ACTIVATION SHALL ALERT THE BUILDING FIRE ALARM SYSTEM. THE FIRE ALARM SYSTEM SHALL CAUSE ALL HOLD OPEN DOORS TO CLOSE UPON ALARM ACTIVATION IN THE BUILDING.
11. ACTIVATION OF AN ALARM ZONE SHALL CAUSE ALL AIR HANDLING EQUIPMENT TO SHUT DOWN (ALL DAMPERS, AIR HANDLERS AND EXHAUST FANS MUST STOP).
12. ALL VISUAL DEVICES WITHIN THE SAME AREA SHALL BE SYNCHRONIZED.
13. ALL FIRE ALARM WIRING SHALL BE IN RED COLORED CONDUIT,/FIRE ALARM CABLING SHALL BE PLENUM RATED.
14. PROVIDE MULTI-TEMPORAL SOUNDING CAPABILITY AT ALL AUDIO DEVICES FOR EMERGENCY NOTIFICATION FOR NON VOICE SYSTEMS COMPONENTS.
15. THE FIRE ALARM SYSTEM MANUFACTURER SHALL PROVIDE NOTIFICATION APPLIANCE CIRCUIT (NAC) POWER EXTENDERS AS REQUIRED.
16. THE DUCT SMOKE DETECTORS SHALL COMPLY WITH IFC 907.2.12.1.2 AND 907.3.1.
17. PROVIDE DITEK #DTK-DFI120S1 SERIES OR EQUAL TVSS FOR 120V SUPPLY TO FIRE ALARM CONTROL PANELS, WITH TVSS DRY CONTACT TO BE MONITORED BY FACP. PROVIDE DITEK DTK-2MHLP24F-WB OR EQUAL FOR ALL FIRE ALARM CABLES THAT EXIT THE PHYSICAL BUILDING. TAMPER SWITCHES DTK-2MHLP24B-WB, AND EACH UB/EXTENDER FIRE ALARM PANEL, NAC, PIV, IDC SURGE: DTK-2MHLP24B-WB OR EQUAL. DIALER SURGE: DTK -2MHTPWB FIBER MEDIA CONVERTER PROTECTOR DTK-PVPIP OR EQUAL.. MANUFACTURERS SHALL BE BY DITEK, SAE, SIEMENS, OR EQUAL.
18. THE CIRCUIT FEEDING THE FIRE ALARM PANEL IS DEDICATED FOR THE FIRE ALARM ONLY. BREAKER SHALL BE PROVIDED WITH A LABEL "FIRE ALARM CIRCUIT" AND SHALL BE RED. PROVIDE BREAKER LOCK ON DEVICE.
19. PROVIDE REMOTE LIGHT WITH TEST SWITCH FOR DUCT SMOKE DETECTOR ON CEILING WHERE UNIT IS ABOVE CEILING.
20. CONTRACTOR SHALL INCLUDE IN BID LABOR AND MATERIAL FOR UP TO (2) DUCT DETECTORS. (5) ANNUNCIATION DEVICES, (2) SMOKE DETECTORS AND (2) PULL STATIONS 100' FROM LOCAL PANEL (IN WALL) AS REQUIRED BY LOCAL AHJ/ENGINEER. INCLUDE ALL PROGRAMMING COSTS.
21. CONTRACTOR RESPONSIBLE FOR SHOP DRAWINGS AS REQUIRED BY LOCAL AHJ.
22. DUCT DETECTORS SHALL BE VERIFIED WITH THE MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION. TOTAL QUANTITY MINIMUM SHALL BE BASED ON BOTH MECHANICAL SCHEDULES AND MECHANICAL PLAN LOCATIONS AND ELECTRICAL PLANS. WHEN DEVICE QUANTITIES (ELECTRICAL VS. MECHANICAL) ARE IN CONFLICT, PROVIDE THE GREATER QUANTITY OF DETECTORS.
23. DIGITAL ALARM COMMUNICATOR TRANSMITTER SHALL BE ACCEPTABLE TO THE REMOTE CENTRAL STATION AND SHALL COMPLY WITH UL 632. CELLULAR LINE – SINGLE MAIN SOURCE. PROVIDE NAPCO STARLINK (SLD-CMDA-FIRE) FIRE ALARM COMMUNICATOR AND SLE-ANTEXT50 EXTERNAL ANTENNA TO OR EQUAL AND COORDINATED WITH THE CELLULAR DIAL OUT SERVICE. CELLULAR DIAL OUT SHALL BE BACKED UP AS PART OF BATTERY BACKUP AS WELL AS GENERATOR BACKED UP WHERE AVAILABLE. FUNCTIONAL PERFORMANCE: UNIT SHALL RECEIVE AN ALARM, SUPERVISORY, OR TROUBLE SIGNAL FROM FIRE-ALARM CONTROL UNIT AND AUTOMATICALLY CAPTURE A PRESET NUMBER FOR A REMOTE CENTRAL STATION. WHEN CONTACT IS MADE WITH CENTRAL STATION(S), SIGNALS SHALL BE TRANSMITTED. IF SERVICE ON THE CELLULAR LINE IS INTERRUPTED FOR LONGER THAN 45 SECONDS, TRANSMITTER SHALL INITIATE A LOCAL TROUBLE SIGNAL. TRANSMITTER SHALL AUTOMATICALLY REPORT CELLULAR SERVICE RESTORATION TO THE CENTRAL STATION. IF SERVICE IS LOST, TRANSMITTER SHALL INITIATE THE LOCAL TROUBLE SIGNAL. MANUFACTURERS SHALL BE BY NAPCO, SLE, HONEYWELL, OR EQUAL.

FIRE ALARM SYSTEM MATRIX	BUILDING SYSTEM OUTPUTS																							
	ACTIVATE COMMON ALARM SIGNAL INDICATOR	ACTIVATE AUDIBLE ALARM SIGNAL	ACTIVATE VISIBLE COMMON ALARM SIGNAL	ACTIVATE AUDIBLE SUPERVISORY SIGNAL	ACTIVATE COMMON SUPERVISORY SIGNAL INDICATOR	ACTIVATE AUDIBLE TROUBLE SIGNAL	ACTIVATE COMMON TROUBLE SIGNAL INDICATOR	ACTIVATE ZONE OR DEVICE ALARM - ADDRESS INDICATOR	ACTIVATE GENERAL EVACUATION SIGNAL	DISPLAY CHANGE OF STATUS	TRANSMIT FIRE ALARM SIGNAL TO CENTRAL STATION	TRANSMIT SUPERVISORY SIGNAL TO CENTRAL STATION	TRANSMIT TROUBLE SIGNAL TO CENTRAL STATION	SHUT DOWN RESPECTIVE HVAC	CLOSE ALL FIRE/SMOKE DAMPERS	UNLOCK EXITS AND CONTROL DOORS	RELEASE MAGNETICALLY HELD DOORS	SHOW CHANGE OF STATUS ON ANNUNCIATOR	SHOW CHANGE OF STATUS ON CENTRAL PANEL
MANUAL FIRE ALARM PULL BOXES	X	X				X	X	X			X						X	X	X	X			
BUILDING SMOKE DETECTOR	X	X				X	X	X			X	X									X	X		
DUCT SMOKE DETECTOR			X	X		X		X				X					X		X	X				
AREA HEAT DETECTOR	X	X				X	X	X			X						X	X	X	X				
NOTIFICATION DEVICE SHORT CIRCUIT					X	X		X					X											
OPEN CIRCUIT					X	X		X					X				X							
GROUND FAULT					X	X		X					X											
FIRE ALARM A.C. POWER FAILURE					X	X		X					X											
FIRE ALARM SYSTEM LOW BATTERY					X								X											
AHU SHUTDOW AND SMOKE DAMPER OVERRIDE SWITCH			X	X	X			X					X											
BDA SYSTEM			X	X				X				X										X	X	

BDA AUTOMATIC SUPERVISORY SIGNAL SHALL INCLUDE THE FOLLOWING:
1. LOSS OF NORMAL AC POWER SUPPLY
2. SYSTEM BATTERY CHARGER(S) FAILURE
3. MALFUNCTION OF THE DONOR ANTENNA(S)
4. FAILURE OF ACTIVE RF-EMITTING DEVICES
5. LOW-BATTERY CAPACITY AT 70% RECUCTION OF OPERATINF CAPACITY
6. FAILURE OF CIRTICAL SYSTEM COMPONENTS
7. COMMUNICATION LINK BETWEEN FACP AND IN-BUILDING 2-WAY EMERGENCY RESPONDER COMMUNICATION COVERAGE SYSTEM
8. OSCILLATION OF ACTIVE RF-EMITTING DEVICE(S)

2 FIRE ALARM MATRIX
NOT TO SCALE

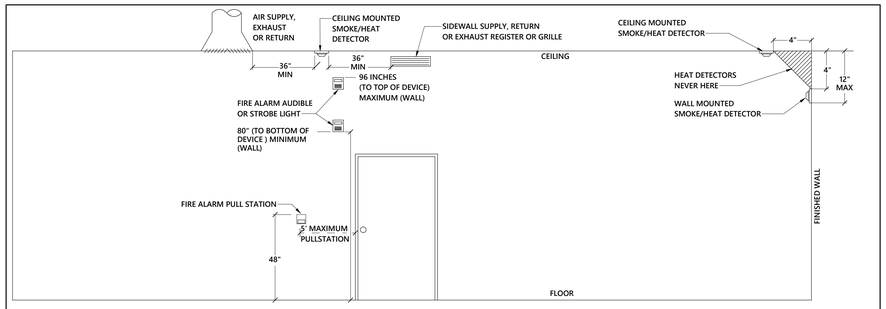


KEY NOTES:

① HIGH SURGE RISK CONNECTION, TYPICAL

② PROTECTED COPPER CONNECTION, TYPICAL. MINIMUM 3; TO PROTECTION EQUIPMENT.

3 SURGE PROTECTION FIRE ALARM
NOT TO SCALE



NOTES:
1. LOCATIONS WHERE TV MOUNT IS BACK TO BACK ON SAME WALL, AN OFFSET OF 8-12" WILL BE NEEDED FOR INSTALLATION OF JACK/RECEPTACLE.
2. DEVICES ABOVE COUNTER TOPS SHALL BE A MAXIMUM OF 48" TO TOP OF DEVICE.
3. DEVICES NEXT TO DOOR EXIT SHALL BE WITHIN 8" (MAXIMUM) TYPICAL OF DOOR UNLESS OBSTACLES SUCH AS SIDELITES, ETC.
4. ALL DEVICES ARE TO CENTER LINE OF DEVICE, UNLESS OTHERWISE NOTED.

4 MOUNTING HEIGHTS OF DEVICES - ELEVATION
NOT TO SCALE

FIRE ALARM SPECIFICATIONS

A. SYSTEM SHALL BE A CENTRALIZED, DIGITAL, ADDRESSABLE, FULLY ELECTRONICALLY SUPERVISED (INCLUDING AUXILIARY SYSTEMS INTERCONNECT WIRING) SYSTEM LISTED BY UL IN COMPLIANCE WITH ALL APPLICABLE NFPA 72 AND OTHER STANDARDS AS WELL AS THE AMERICAN'S WITH DISABILITIES ACT (ADA). ALL FINAL CONNECTIONS, TESTING AND ADJUSTMENTS SHALL BE PERFORMED BY OR UNDER DIRECT SUPERVISION OF AN AUTHORIZED FACTORY REPRESENTATIVE. SYSTEM SHALL BE SIMPLEX, NOTIFIER, SIEMENS, OR APPROVED EQUAL AS ACCEPTED BY THE ENGINEER. SYSTEM SHALL HAVE A 60HR MINIMUM BATTERY BACKUP.

B. INITIATING DEVICE ACTIVATION SHALL CAUSE OPERATION OF THE PROPER ALARM CIRCUIT IN THE CONTROL PANEL, AND OPERATE ALL AUDIBLE AND VISUAL INDICATING ALARMS. ALL AIR HANDLING UNITS SHALL BE STOPPED UPON ANY ALARM INPUT. EACH AIR HANDLER UNIT SHALL BE PROVIDED WITH A SYSTEM CONTROLLED RELAY TO EFFECT SHUTDOWN. ALL ALARM DEVICES AND LAMPS SHALL CONTINUE TO OPERATE UNTIL THE INITIATING DEVICE IS RESET. SUBSEQUENT ALARMS SHALL RESOUND THE SYSTEM. AN AUDIBLE AND VISUAL SIGNAL SHALL INDICATE SYSTEM TROUBLE. THE CONTROL PANEL SHALL PROVIDE FOR ACTIVATING A UL LISTED CENTRAL STATION SIGNAL FOR NOTIFYING THE FIRE DEPARTMENT.

C. MANUAL STATIONS SHALL BE NON-CODED, WITH DUAL-ACTION PULL AND KEY TYPE RESET; SEMI-FLUSH MOUNTED. COMBINATION LIGHT AND HORN SIGNALS SHALL BE FLUSH MOUNTED. WIRING SHALL BE IN CONDUIT AS PREVIOUSLY SPECIFIED, #14 AWG MINIMUM, THHN. ALL J-BOXES USED FOR THE FIRE ALARM SYSTEM SHALL BE PAINTED RED.

D. CONDUCTORS SHALL BE PLENUM-RATED AND INSTALLED IN CONDUIT AND INSTALLED IN COMPLIANCE WITH NFPA 70, ARTICLE 760; IN ADDITION TO WIRING METHODS 300.4.

E. ALL FIRE ALARM WIRING SHALL BE CLASS A.

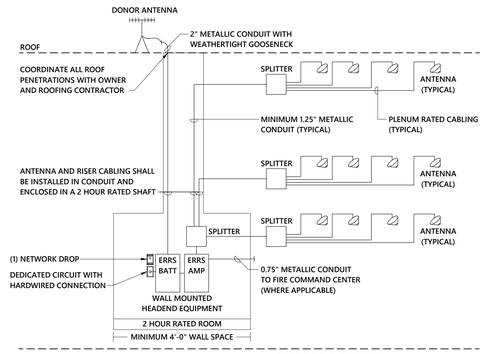
F. MAXIMUM OF 20 DEVICES BETWEEN ISOLATION MODULES.

G. PROVIDE ALL REQUIRED MODULES, POWER EXTENDERS, PROGRAMMING, ETC. FOR A COMPLETE AND OPERATIONAL SYSTEM.

H. SUBMIT FIRE ALARM SHOP DRAWINGS CONSISTING OF PRODUCT DATA, TO THE ENGINEER AND FOR APPROVAL.

I. FILL OUT NFPA 72 CERTIFICATION REPORT AND SUBMIT TO ENGINEER AND AUTHORITY HAVING JURISDICTION.

J. WARRANTY - ALL WORK PERFORMED AND ALL MATERIALS AND EQUIPMENT FURNISHED UNDER THIS CONTRACT SHALL BE FREE FROM DEFECTS AND SHALL REMAIN SO FOR A PERIOD OF AT LEAST TWO (2) YEARS FROM THE DATE OF ACCEPTANCE BY THE PROFESSIONAL ENGINEER AND/OR OWNER. THE FULL COST OF MAINTENANCE, LABOR, AND MATERIALS REQUIRED TO CORRECT ANY DEFECT DURING THIS TWO YEAR PERIOD SHALL BE IMMEDIATELY CORRECTED AT NO ADDITIONAL COST TO THE OWNER. ANY DEFECTS THAT RENDER THE SYSTEM INOPERATIVE SHALL BE REPAIRED WITHIN 24 HOURS OF THE OWNER NOTIFYING THE CONTRACTOR. OTHER DEFECTS SHALL BE REPAIRED WITHIN 48 HOURS OF THE OWNER NOTIFYING THE CONTRACTOR.



GENERAL NOTES:

A. ELECTRICAL CONTRACTOR SHALL PROVIDE THE SYSTEM SURVEY IN THEIR BASE BID. ELECTRICAL CONTRACTOR SHALL PROVIDE AN ADD ALTERNATE FOR THE COMPLETE SYSTEM COVERING 100% OF THE BUILDING. IF ONLY A PARTIAL SYSTEM IS REQUIRED BASED ON THE SYSTEM SURVEY AND AHJ, THEN THE COST OF THE REDUCED SYSTEM SCOPE SHALL BE NEGOTIATED.

B. EMERGENCY RESPONDER RADIO SYSTEM (ERRS) MAY ALSO BE REFERRED TO AS BI-DIRECTIONAL ANTENNA SYSTEM (BDA) OR FIRST RESPONDER DISTRIBUTED ANTENNA SYSTEM.

C. ERRS SYSTEM SURVEY SHALL CONSIST OF TWO PARTS. PART ONE SHALL BE ADMINISTERED AT THE START OF CONSTRUCTION TO DOCUMENT THE AVAILABLE SIGNAL AT THE SITE. PART TWO SHALL BE ADMINISTERED WHEN ALL STEEL, GYPBOARD, AND WINDOWS HAVE BEEN INSTALLED.

D. DETAIL IS DIAGRAMATIC AND ONLY INDICATES MAIN COMPONENTS AND APPROXIMATE LOCATIONS. QUANTITY AND LOCATIONS OF EQUIPMENT ARE DETERMINED BY THE 3RD PARTY DELIGATED DESIGN. SYSTEM DESIGN SHALL BE BASED ON THE ACTUAL CONSTRUCTION OF THE BUILDING. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL REQUIREMENTS WITH VENDOR.

SPECIFICATIONS:

A. ELECTRICAL CONTRACTOR SHALL FURNISH, INSTALL, AND TEST A COMPLETE AND OPERATING EMERGENCY RESPONDER RADIO SYSTEM ("SYSTEM"). THE SYSTEM SHALL BE PROVIDED FOR THE PURPOSE OF ASSURING RELIABLE EMERGENCY COMMUNICATIONS.

B. THE REQUIREMENTS ESTABLISHED BY THE AHJ IN EFFECT AT THE TIME OF SYSTEM INSTALLATION SUPERSEDE THE SPECIFICATIONS IN THIS SECTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASSURE THE INSTALLED SYSTEM COMPLIES WITH ALL CURRENTLY APPLICABLE LOCAL, NATIONAL AND INDUSTRY CODES AS ADOPTED BY THE AHJ.

C. TWO SETS OF FREQUENCIES ARE TO BE UTILIZED ON THE SYSTEM. THE FOLLOWING FCC-LICENSED FACILITIES ARE TO BE CARRIED ON THE SYSTEM: FCC CALL SIGN, DOWNSTREAM/BASE TO MOBILE FREQUENCY, UPSTREAM/MOBILE TO BASE FREQUENCY AND CHANNEL BANDWIDTH. TRANSMISSIONS ON EACH SET OF FREQUENCIES MUST INDIVIDUALLY MEET THE COVERAGE, MINIMUM SIGNAL AND MINIMUM VOICE QUALITY REQUIREMENTS OF THE AHJ. EQUIPMENT SELECTED FOR THIS SYSTEM MUST BE CAPABLE OF BEING CONFIGURED TO DIFFERENT FREQUENCY PAIRS IN THE 700-800 Mhz PUBLIC SAFETY FREQUENCY BANDS. THESE CHANGES MAY LATER BE NECESSARY DUE TO FUTURE ADDITIONS OR OPTIMIZATION OF RADIO SYSTEMS MAINTAINED BY THE AHJ. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO CONFIRM THE FREQUENCIES IN USE WITH THE AHJ BEFORE PROCEEDING WITH THE SYSTEM INSTALLATION. ALL CABLE AND PASSIVE ELECTRONIC COMPONENTS SHALL HAVE A MINIMUM PASS BAND OF 400-2700 Mhz.

SPECIFICATIONS (CONTINUED):

D. SIGNALS AT OR ABOVE THE MINIMUM LEVELS ARE TO BE RECEIVABLE TO AND FROM 95% OF ALL AREAS WITHIN THE BUILDING. SPACES OR ROOMS DEFINED AS CRITICAL AREAS REQUIRE 99% COVERAGE. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SYSTEM DESIGN AND INSTALLATION THAT PROVIDES ENHANCEMENT ONLY TO THOSE AREAS OF THE BUILDING WHERE EXISTING OFF-AIR SERVICE DOES NOT MEET THE MINIMUM LEVELS AS DESCRIBED IN THE LATEST VERSIONS OF NFPA 72 AND IFC. CARE MUST BE TAKEN IN ENGINEERING A SYSTEM THAT WILL NOT CAUSE INTERFERENCE TO THE AUTHORITY'S RADIO SYSTEM OUTSIDE THE BUILDING AND SHALL NOT CAUSE HARMFUL INTERFERENCE TO OTHER RF SYSTEMS INSIDE THE BUILDING.

E. THE SYSTEM SHALL BE DESIGNED FOR CONTINUOUS, ALWAYS-ON SERVICE. SIX (6) MALFUNCTION ALARMS FOR THE SYSTEM SHALL BE PROVIDED AND CONNECTED TO THE BUILDING FIRE ALARM SYSTEM. CONTRACTOR SHALL PROVIDE 24 HOUR BATTERY BACKUP. BATTERIES SHALL BE CONTAINED IN A NEMA 4 TYPE WATERPROOF CABINET.

F. ALL CABLING, WITH THE EXCEPTION OF RADIATING CABLE AND ANTENNA JUMPER CABLES MEASURING LESS THAN 2 FEET IN LENGTH, SHALL BE INSTALLED IN CONDUIT. ALL EXPOSED CABLE, INCLUDING FLEXIBLE JUMPER CABLES, SHALL BE PLENUM RATED, UTILIZING A JACKET OF NON-HALOGENATED, FIRE RETARDANT POLYOLEFIN.

G. GROUND AND BOND CABLE SHIELDS AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS AND LATEST NFPA 70 NEC REQUIREMENTS. THE DONOR ANTENNA MAST SHALL BE GROUNDED PER LATEST NFPA 70 NEC REQUIREMENTS. GROUNDING BLOCKS AND SURGE PROTECTION SHALL BE PROVIDED FOR OUTSIDE CABLING.

H. SHOP DRAWINGS SHALL BE SUBMITTED AND APPROVED BY THE ENGINEER AND AHJ PRIOR TO INSTALLATION. PROVIDE A SYSTEM BLOCK DIAGRAM INDICATING THE DONOR ANTENNA(S), HEADEND EQUIPMENT, PASSIVE COMPONENTS AND IN-BUILDING ANTENNAS. INCLUDE THE RF LINK BUDGET. PROVIDE A OVERLAY OF THE SYSTEM DESIGN ON BUILDING FLOOR PLAN DRAWINGS AND OVERLAY ON FLOOR PLAN DRAWINGS OF THE PREDICTED SIGNAL STRENGTH WITHIN THE COVERAGE AREA INDICATING, AT A MINIMUM, THE –95 DBM DOWNLINK (BASE TO MOBILE) SIGNAL STRENGTH FOR ALL COVERAGE AREAS.

I. CONTRACTOR SHALL PROVIDE THE FOLLOWING DOCUMENTS AT PROJECT CLOSEOUT: AS-BUILT DRAWINGS IN PDF AND AUTOCAD FORMATS, COVERAGE/ACCEPTANCE TEST RESULTS, DONOR ANTENNA ISOLATION, SPECTRUM ANALYSIS DEMONSTRATING ONLY THE INTENDED FREQUENCIES ARE BEING CARRIED ON THE SYSTEM, SPECTRUM ANALYSIS DEMONSTRATING NO SPURIOUS OSCILLATIONS, PIM OR OTHER INTERMODULATION DISTURBANCES ARE BEING CARRIED ON THE SYSTEM, SIGNAL LEVELS RECEIVED AT THE DONOR ANTENNA, SIGNAL LEVELS AT THE INPUT AND OUTPUT OF THE HEADEND EQUIPMENT, GAIN SETTINGS, OPERATION AND MAINTENANCE MANUAL IN HARDCOPY AND PDF FORMAT AND WARRANTY DOCUMENTS.

J. CONTRACTOR SHALL PROVIDE A ONE YEAR WARRANTY ON PARTS AND LABOR AND PROVIDE A ONE YEAR MAINTENANCE AGREEMENT. MAINTENANCE AGREEMENT SHALL INCLUDE 24/7 EMERGENCY RESPONSE WITHIN TWO HOURS OF NOTIFICATION AND ANNUAL TESTING.

5 EMERGENCY RESPONDER RADIO SYSTEM (ERRS) - DIAGRAMATIC ONLY
NOT TO SCALE

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NCCCS #2689

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3/3/25

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1042 Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

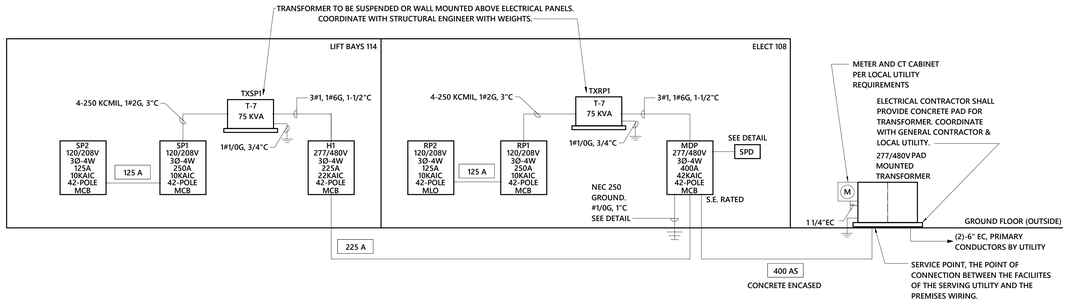
ELECTRICAL DETAILS - SYSTEMS

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER

E604



1 **POWER RISER DRAFTING VIEW**
1/8" = 1'-0"

ELECTRICAL EQUIPMENT RISER SCHEDULE

PANEL NAME	SHORT CIRCUIT RATING	VOLTAGE	Isc	MAINS	CALCULATED MAXIMUM 80%	TOTAL ESTIMATED DEMAND CIRCUIT	NUMBER OF POLES	NUMBER OF WIRES	FEEDER WIRE & CONDUIT	PANEL LOCATION	PANEL FED FROM
MDP	42 KAIC	480 V		400 A	320 A	197 A	3	4		ELECT SPACE	UTILITY TRANSFORMER
RP1	10 KAIC	208 V		250 A	200 A	100 A	3	4		ELECT SPACE	TXRP1
SP1	10 KAIC	208 V		250 A	200 A	112 A	3	4		LIFT BAYS SPACE	TXSP1
H1	22 KAIC	480 V		225 A	180 A	69 A	3	4		LIFT BAYS SPACE	MDP
RP2	10 KAIC	208 V		125 A	100 A	32 A	3	4		ELECT SPACE	RP1
SP2	10 KAIC	208 V		125 A	100 A	58 A	3	4		LIFT BAYS SPACE	SP1

DRY-TYPE TRANSFORMER SCHEDULE

TRANSFORMER TYPE	SECONDARY VOLTAGE	KVA RATING	PRIMARY			SECONDARY			SERVICE GROUND
			FLA	BREAKER	WIRE & CONDUIT	FLA	BREAKER	WIRE & CONDUIT	
T-7	208/120V	75	93.8	125	3#1, 1#6G, 1 1/2"C	208	250	4-250, 1#2G,3"C	#1/0, 3/4"C

NOTE: HOUSEKEEPING PADS SHALL HAVE OSHA COMPLIANT, SAFETY YELLOW, EPOXY PAINT SUITABLE FOR CONCRETE.: 2

VOLTAGE DROP, CONDUCTOR , AND CONDUIT SIZING TABLE

BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	DISTANCE (FT) VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	DISTANCE(FT) VOLTAGE/POLE 208V - 2P
15A	2#12,1#12G	3/4"	0-60	0-145	3#12,1#12G	3/4"	0-109
	2#10, 1#10G	3/4"	61-99	146-230	3#10, 1#10G	3/4"	110-173
	2#8, 1#8G	3/4"	100-155	231-363	3#8, 1#8G	3/4"	174-272
	2#6, 1#6G	3/4"	156-245	364-565	3#6, 1#6G	3/4"	273-424
	2#4, 1#4G	1"	246-380	566-882	3#4, 1#4G	1"	425-662
	2#3, 1#3G	1-1/4"	381-470	883-1092	3#3, 1#3G	1-1/4"	663-820
	2#2, 1#2G	1-1/4"	471-585	1093-1356	3#2, 1#2G	1-1/4"	821-1018
	2#1, 1#1G	1-1/2"	586-720	1357-1663	3#1, 1#1G	1-1/2"	1019-1248
BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE/POLE 208V - 2P
20A	2#12,1#12G	3/4"	0-45	0-108	3#12,1#12G	3/4"	0-81
	2#10, 1#10G	3/4"	46-75	109-172	3#10, 1#10G	3/4"	82-129
	2#8, 1#8G	3/4"	76-115	173-272	3#8, 1#8G	3/4"	130-204
	2#6, 1#6G	3/4"	116-180	273-424	3#6, 1#6G	3/4"	205-318
	2#4, 1#4G	1"	181-285	425-661	3#4, 1#4G	1"	319-496
	2#3, 1#3G	1-1/4"	286-350	662-819	3#3, 1#3G	1-1/4"	497-615
	2#2, 1#2G	1-1/4"	351-440	820-1017	3#2, 1#2G	1-1/4"	616-763
	2#1, 1#1G	1-1/2"	441-540	1018-1247	3#1, 1#1G	1-1/2"	764-936
BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE/POLE 208V - 2P
30A	2#10, 1#10G	3/4"	0-50	0-115	3#10, 1#10G	3/4"	0-86
	2#8, 1#8G	3/4"	51-78	116-181	3#8, 1#8G	3/4"	87-136
	2#6, 1#6G	3/4"	79-122	182-282	3#6, 1#6G	3/4"	137-212
	2#4, 1#4G	1"	123-190	283-441	3#4, 1#4G	1"	213-331
	2#3, 1#3G	1-1/4"	191-236	442-546	3#3, 1#3G	1-1/4"	332-410
	2#2, 1#2G	1-1/4"	237-292	547-678	3#2, 1#2G	1-1/4"	411-509
	2#1, 1#1G	1-1/2"	293-360	679-831	3#1, 1#1G	1-1/2"	510-624
BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE/POLE 208V - 2P
35A	2#8, 1#10G	3/4"	0-66	0-155	3#8, 1#10G	3/4"	0-116
	2#6, 1#8G	3/4"	67-105	156-242	3#6, 1#8G	3/4"	117-182
	2#4, 1#6G	1"	106-163	243-378	3#4, 1#6G	1"	183-283
	2#3, 1#6G	1"	164-202	379-468	3#3, 1#6G	1"	284-351
	2#2, 1#3G	1"	203-251	469-581	3#2, 1#3G	1-1/4"	352-436
	2#1, 1#3G	1-1/4"	252-308	582-712	3#1, 1#3G	1-1/2"	437-535
BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE/POLE 208V - 2P
40A	2#8, 1#10G	3/4"	0-59	0-136	3#8, 1#10G	3/4"	0-102
	2#6, 1#8G	3/4"	60-92	137-212	3#6, 1#8G	3/4"	103-159
	2#4, 1#6G	1"	93-143	213-330	3#4, 1#6G	1"	160-248
	2#3, 1#4G	1"	144-177	331-409	3#3, 1#4G	1-1/4"	249-307
	2#2, 1#4G	1"	178-220	410-508	3#2, 1#4G	1-1/4"	308-381
	2#1, 1#3G	1-1/4"	221-270	509-623	3#1, 1#3G	1-1/2"	382-468
BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE/POLE 208V - 2P
45A	2#6, 1#10G	3/4"	0-81	0-188	3#6, 1#10G	3/4"	0-141
	2#4, 1#6G	1"	82-128	189-294	3#4, 1#6G	1"	142-220
	2#3, 1#6G	1"	129-157	295-364	3#3, 1#6G	1"	221-273
	2#2, 1#4G	1"	158-195	365-452	3#2, 1#4G	1-1/4"	274-339
	2#1, 1#4G	1-1/4"	196-240	453-554	3#1, 1#4G	1-1/2"	340-416
BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE/POLE 208V - 2P
50A	2#6, 1#10G	3/4"	0-74	0-169	3#6, 1#10G	3/4"	0-127
	2#4, 1#6G	1"	75-114	170-264	3#4, 1#6G	1"	128-198
	2#3, 1#6G	1"	115-141	265-327	3#3, 1#6G	1"	199-246
	2#2, 1#4G	1"	142-175	328-406	3#2, 1#4G	1-1/4"	247-305
	2#1, 1#4G	1-1/4"	176-216	407-498	3#1, 1#4G	1-1/2"	306-374
BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE/POLE 208V - 2P
55A	2#6, 1#10G	3/4"	0-66	0-154	3#6, 1#10G	3/4"	0-115
	2#4, 1#6G	1"	67-104	155-240	3#4, 1#6G	1"	116-180
	2#3, 1#6G	1"	105-129	241-297	3#3, 1#6G	1"	181-223
	2#2, 1#4G	1"	130-160	298-369	3#2, 1#4G	1-1/4"	224-277
	2#1, 1#4G	1-1/4"	161-196	370-453	3#1, 1#4G	1-1/2"	278-340
BREAKER SIZE	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE / POLE 120V-1P	277V-1P	CONDUCTORS (60C)	CONDUIT SIZE	VOLTAGE/POLE 208V - 2P
60A	2#4, 1#10G	3/4"	0-95	0-220	3#4, 1#10G	1"	0-165
	2#3, 1#8G	1"	96-118	221-273	3#3, 1#8G	1"	166-205
	2#2, 1#8G	1"	119-146	274-339	3#2, 1#8G	1-1/4"	206-254
	2#1, 1#6G	1-1/4"	147-180	340-415	3#1, 1#6G	1-1/2"	255-312

NOTES:

1. GROUNDING CONDUCTOR SIZE BASED ON NEC 250.122 (B). LUGS IN A LOCAL JUNCTION BOX TO REDUCE SIZE TO MAKE FINAL CONNECTION AT AN ACCESIBLE CEILING / LOCATION.
2. VOLTAGE DROP BASED ON 60°C CONDUCTORS WITH A MAX CONTINOUS LOADING FOR RESPECTIVE BREAKER (100% LOAD)
3. CONDUIT BASED ON EMT AND SCHEDULE 40 PVC INSTALLATIONS
4. CONDUCTORS BASED ON COPPER.

2 **VOLTAGE DROP - SINGLE PHASE**
1/2" = 1'-0"

VOLTAGE DROP, CONDUCTOR , AND CONDUIT SIZING TABLE

BREAKER SIZE	CONDUCTORS (80°C)	CONDUIT	DISTANCE (FT) VOLTAGE / POLE 208V-3P	480V-3P
15A	4#12,1#12G	3/4"	0-125	0-290
	4#10, 1#10G	3/4"	126-199	291-461
	4#8, 1#8G	3/4"	200-314	462-726
	4#6, 1#6G	1"	315-490	727-1132
	4#4, 1#4G	1-1/4"	491-764	1133-1764
	4#3, 1#3G	1-1/4"	765-947	1765-2185
	4#2, 1#2G	1-1/4"	948-1176	2186-2714
	4#1, 1#1G	1-1/2"	1177-1442	2715-3327
20A	CONDUCTORS (80°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#12,1#12G	3/4"	0-94	0-217
	4#10, 1#10G	3/4"	95-149	218-345
	4#8, 1#8G	3/4"	150-236	346-544
	4#6, 1#6G	1"	237-368	545-849
	4#4, 1#4G	1-1/4"	369-573	850-1323
	4#3, 1#3G	1-1/4"	574-710	1324-1639
	4#2, 1#2G	1-1/4"	711-882	1640-2035
	4#1, 1#1G	1-1/2"	883-1081	2036-2495
30A	CONDUCTORS (80°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#10, 1#10G	3/4"	0-99	0-230
	4#8, 1#8G	3/4"	100-157	231-363
	4#6, 1#6G	1"	158-245	364-566
	4#4, 1#4G	1-1/4"	246-382	567-882
	4#3, 1#4G	1-1/4"	383-473	883-1092
	4#2, 1#2G	1-1/4"	474-588	1093-1357
	4#1, 1#1G	1-1/2"	589-721	1358-1663
35A	CONDUCTORS (80°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#8, 1#10G	3/4"	0-134	0-311
	4#6, 1#8G	1"	135-210	312-485
	4#4, 1#6G	1-1/4"	211-327	486-756
	4#3, 1#6G	1-1/4"	328-405	757-936
	4#2, 1#3G	1-1/4"	406-504	937-1163
	4#1, 1#3G	1-1/2"	505-618	1164-1426
40A	CONDUCTORS (80°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#8, 1#10G	3/4"	0-118	0-272
	4#6, 1#8G	1"	119-184	273-424
	4#4, 1#6G	1-1/4"	185-286	425-661
	4#3, 1#6G	1-1/4"	287-355	662-819
	4#2, 1#3G	1-1/4"	356-441	820-1017
	4#1, 1#3G	1-1/2"	442-540	1018-1247
45A	CONDUCTORS (80°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#6, 1#10G	1"	0-163	0-377
	4#4, 1#6G	1-1/4"	164-254	378-588
	4#3, 1#6G	1-1/4"	255-315	589-728
	4#2, 1#4G	1-1/4"	316-392	729-904
	4#1, 1#4G	1-1/2"	393-480	905-1109
50A	CONDUCTORS (80°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#6, 1#10G	1"	0-147	0-339
	4#4, 1#6G	1-1/4"	148-229	340-529
	4#3, 1#6G	1-1/4"	230-284	530-655
	4#2, 1#4G	1-1/4"	285-352	656-814
	4#1, 1#4G	1-1/2"	353-432	815-998
55A	4#6, 1#10G	1"	0-133	0-308
	4#4, 1#6G	1-1/4"	134-208	309-481
	4#3, 1#6G	1-1/4"	209-258	482-596
	4#2, 1#4G	1-1/4"	259-320	597-740
	4#1, 1#4G	1-1/2"	321-393	741-907
60A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208-3P	480V-3P
	4#4, 1#10G	1-1/4"	0-191	0-441
	4#3, 1#8G	1-1/4"	192-236	442-546
	4#2, 1#8G	1-1/4"	237-294	547-678
	4#1, 1#8G	1-1/2"	295-360	679-831
65A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#4, 1#8G	1-1/4"	0-176	0-407
	4#3, 1#8G	1-1/4"	177-218	408-504
	4#2, 1#8G	1-1/4"	219-271	505-626
	4#1, 1#8G	1-1/2"	272-332	627-767
70A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#4, 1#8G	1-1/4"	0-163	0-378
	4#3, 1#8G	1-1/4"	164-202	379-468
	4#2, 1#4G	1-1/4"	203-252	469-581
	4#1, 1#4G	1-1/2"	253-309	582-713
75A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#3, 1#8G	1-1/4"	0-189	0-437
	4#2, 1#6G	1-1/4"	190-235	438-542
	4#1, 1#4G	1-1/2"	236-288	543-665
80A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#3, 1#8G	1-1/4"	0-177	0-409
	4#2, 1#6G	1-1/4"	178-220	410-508
	4#1, 1#4G	1-1/2"	221-270	509-623
85A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#3, 1#8G	1-1/4"	0-167	0-385
	4#2, 1#6G	1-1/4"	168-207	386-478
	4#1, 1#4G	1-1/2"	208-254	479-587
90A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#2, 1#8G	1-1/4"	0-196	0-452
	4#2, 1#6G	1-1/2"	197-240	453-554
95A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#2, 1#8G	1-1/4"	0-185	0-428
	4#1, 1#6G	1-1/2"	186-227	429-525
100A	CONDUCTORS (60°C)	CONDUIT	VOLTAGE / POLE 208V-3P	480V-3P
	4#1, 1#8G	1-1/2"	0-216	0-499

NOTES:

1. GROUNDING CONDUCTOR SIZE BASED ON NEC 250.122 (B). LUGS IN A LOCAL JUNCTION BOX TO REDUCE SIZE TO MAKE FINAL CONNECTION AT AN ACCESIBLE CEILING / LOCATION.
2. VOLTAGE DROP BASED ON 60°C CONDUCTORS WITH A MAX CONTINOUS LOADING FOR RESPECTIVE BREAKER (100% LOAD)
3. CONDUIT BASED ON EMT AND SCHEDULE 40 PVC INSTALLATIONS
4. CONDUCTORS BASED ON COPPER.

3 **VOLTAGE DROP - THREE PHASE**
1/2" = 1'-0"

FEEDER SCHEDULE FOR COPPER CONDUCTORS TO SPECIFIC BREAKER SIZE

FEEDER AMPS	WIRE SIZE TEMP 60°C (CU)	WIRE SIZE TEMP 75°C (CU)
15 A	4#12, 1#12G, 3/4"C	4#12, 1#12G, 3/4"C
20 A	4#12, 1#12G, 3/4"C	4#12, 1#12G, 3/4"C
25 A	4#10, 1#10G, 3/4"C	4#10, 1#10G, 3/4"C
30 A	4#10, 1#10G, 3/4"C	4#10, 1#10G, 3/4"C
35 A	4#8, 1#10G, 3/4"C	4#8, 1#10G, 3/4"C
40 A	4#8, 1#10G, 3/4"C	4#8, 1#10G, 3/4"C
45 A	4#6, 1#10G, 1"C	4#8, 1#10G, 3/4"C
50 A	4#6, 1#10G, 1"C	4#8, 1#10G, 3/4"C
60 A	4#4, 1#10G, 1-1/4"C	4#6, 1#10G, 1"C
70 A	4#4, 1#8G, 1-1/4"C	4#4, 1#8G, 1-1/4"C
80 A	4#3, 1#8G, 1-1/4"C	4#4, 1#8G, 1-1/4"C
90 A	4#2, 1#8G, 1-1/4"C	4#3, 1#8G, 1-1/4"C
100 A	4#1, 1#8G, 1 -1/2"C	4#3, 1#8G, 1-1/4"C
110 A		4#2, 1#6G, 1-1/2"C
125 A		4#1, 1#6G, 2"C
150 A		4#1/0, 1#6G, 2"C
175 A		4#2/0, 1#6G, 2"C
200 A		4#3/0, 1#6G, 2-1/2"C
225 A		4#4/0, 1#4G, 2-1/2"C
250 A		4-250 KCMIL, 1#4G, 3"C
300 A		4-350 KCMIL, 1#4G, 3"C
350 A		4-500 KCMIL, 1#3G, 3-1/2"C
400 A		(2)-4#3/0, 1#3G, 2-1/2"C
400 AS		(2)-4#3/0, 2-1/2"C

NOTES: 1.) FOR TERMINATIONS RATED 100A OR LESS, THE ELECTRICAL CONTRACTOR SHALL VERIFY THE TERMINATIONS ARE LISTED FOR 75°C. WHERE 100A OR LESS RATED TERMINATIONS ARE LISTED 60°C, THE ELECTRICAL CONTRACTOR SHALL USE THE 60°C FEEDER LISTED IN THE TABLE.

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3/3/25

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BID DOCUMENTS

ELECTRICAL DIAGRAMS

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER

E701

Opt # 23-0128

ROOF TOP UNIT SCHEDULE (DX COOLING, GAS HEAT, R-410 REFRIGERANT)

SYMBOL	LOCATION	AREA SERVED	ELECTRICAL DATA									
			COMP QTY.	RLA/FLA	MCA	MOCP	SUPPLY FAN (H.P.)	RELIEF/EXH. FAN (H.P.)	VOLTS	PHASE	Hz	DISCONNECT
RTU-1	ROOFTOP	AUTO SIM B / STORAGE	1	6.4/0.48	15.3	20	1.2	N/A BAR. RELIEF	460	3	60	30/F20-3P-3R
RTU-2	ROOFTOP	AUTO SIM LAB A	1	5.7/0.48	14.4	20	1.2	N/A BAR. RELIEF	460	3	60	30/F20-3P-3R
RTU-3	ROOFTOP	MAIN LOBBY	2	12.2/1.7	25.1	30	2.4	N/A BAR. RELIEF	460	3	60	30/F30-3P-3R
RTU-4	ROOFTOP	OFFICES / ADMIN	1	6.4/0.48	15.3	20	1.2	N/A BAR. RELIEF	460	3	60	30/F20-3P-3R
RTU-5	ROOFTOP	LIFT BAYS / TOOLS	2	19.4/3.2	36.6	45	3.5	N/A BAR. RELIEF	460	3	60	60/F45-3P-3R

NOTES:

1. PROVIDE ALL UNITS WITH: FUSED DISCONNECT.
2. PROVIDE EACH UNIT 2000CFM OR GREATER WITH A PHOTOELECTRIC TYPE SMOKE DETECTOR, INSTALLED IN THE RETURN DUCT AT THE UNIT CONNECTION WIRED TO SHUT DOWN THE UNIT UPON ACTIVATION. SPOT DETECTOR SHALL BE LOCATED IN ACCESSIBLE LOCATION, ACCESSED FROM INSIDE THE UNIT. SMOKE DETECTOR SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN DUCT BY THE MECHANICAL CONTRACTOR.
3. ALL ELECTRICAL COMPONENTS SERVING AND WITHIN ROOFTOP UNITS MUST HAVE A MINIMUM SCCR RATING OF 35 KAIC.

FAN SCHEDULE

SYMBOL	LOCATION	ELECTRICAL DATA			ACCESSORIES	CONTROLS
		AMPS	H.P.	VOLTAGE		
F-1	ROOF	1.5	1/10	115/1/60	DISCONNECT SWITCH BY M.C.	1
F-2	ROOF	9.8	1/2	115/1/60	DISCONNECT SWITCH BY M.C.	4
F-3	ELECT 108	6.6	1/2	115/1/60	DISCONNECT SWITCH BY M.C.	2
F-4	EQUIP STOR 113	0.19	0	115/1/60	DISCONNECT SWITCH BY M.C.	1

CONTROLS

1: CONTROLLED BY BUILDING AUTOMATION SYSTEM
2: ROOM THERMOSTAT; BAS STATUS
3: INTERLOCK WITH ASSOC. HOOD; BAS STATUS
4: WALL MOUNTED MANUAL SWITCH (2 HR TIMER) & CO/NO2 SENSOR; BAS STATUS

NOTES:

1. MECHANICAL CONTRACTOR SHALL PROVIDE MAGNETIC STARTER WITH AUXILIARY CONTACTS AS REQUIRED.

DUCTLESS SPLIT SYSTEMS (COOLING ONLY)

INDOOR							OUTDOOR							
			ELECTRICAL DATA							ELECTRICAL DATA				
SYMBOL	LOCATION	AREA SERVED	MCA	MOCP	VOLTAGE/PHASE	DISCONNECT	SYMBOL	LOCATION	AREA SERVED	MCA	MOCP	VOLTAGE	PH	DISCONNECT
IDU-1	ELECT 108	ELECT 108	0.0A	20	208/1	30/F15-2P	ODU-1	ROOFTOP	ELECT 108	9.2A	15	208	1	30/F15-2P-3R

NOTES:

1. PROVIDE UNITS WITH NON-LOCKING DISCONNECT FOR INDOOR UNIT.
2. FOR ALL INDOOR UNITS THE POWER SUPPLY IS FED FROM THE ASSOCIATED OUTDOOR UNIT, THE OUTDOOR UNIT SHALL RECEIVE A DEDICATED ELECTRICAL CONNECTION AS NOTED IN THE SCHEDULE. THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER TO THE NOTED UNITS. THE MECHANICAL CONTRACTOR SHALL PROVIDE DISCONNECT SWITCHES, AND POWER WIRING BETWEEN DISCONNECT AND EQUIPMENT.

WATER HEATER SCHEDULE

SYMBOL	LOCATION	ELECTRICAL DATA			DISCONNECT
		WATTS	VOLTAGE	PHASE	
WH1	JAN 109	4500	208	1	30/F30-2P
RCP1	JAN 109	125	120	1	MANUAL MOTOR STARTER

LIGHTING SEQUENCE OF OPERATION

A COMPLETE AND OPERATIONAL LIGHTING CONTROL SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS (SECTION 260923) AND AS INTENDED ON THESE PLANS. ALL CONTROL POINTS AND EQUIPMENT SEQUENCES OF OPERATION LISTED IN SPECIFICATION SECTION 260923 SHALL BE CONSIDERED IN ADDITION TO THOSE LISTED HERE. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STRINGENT SHALL APPLY.

SYSTEM DESCRIPTION:
LIGHTING CONTROLS ARE BASED ON INDEPENDENT OCCUPANCY SENSORS WITH SEPARATE TIME CLOCK FOR EXTERIOR LIGHTING.

OCCUPANCY SENSORS:

1. ALL OCCUPANCY SENSORS SHALL BE PROGRAMMED FOR AUTOMATIC ON (FULL LEVELS) AND AUTOMATIC OFF.
2. ALL VACANCY SENSORS SHALL BE PROGRAMMED FOR MANUAL ON (FULL LEVELS) AND AUTOMATIC OFF.

TIMER SETTINGS :

A. WALL SWITCH PASSIVE INFRARED: 2 MINUTES FOR INDIVIDUAL RESTROOMS AND STORAGE ROOMS.
B. CLASSROOMS OCCUPANCY/VACANCY : 30 MINS.
C. WALL SWITCH OCCUPANCY/VACANCY SENSORS OFFICES: 5 MINS.
D. CONFERENCE ROOM SENSORS OFFICES: 10 MINS.
E. OTHER SPACES NOT IDENTIFIED: 15 MINS.

INDEPENDENT TIME CLOCK:

A. EXTERIOR LIGHTING ZONE, TIME SCHEDULE CONTROL.

EXTERIOR LIGHTING CONTROL:

A. EXTERIOR LIGHTING CONTROL IS VIA SCHEDULED TIME CONTROL.
B. MANUAL OVERRIDE SWITCHING FOR LOCAL EXTERIOR LIGHTING AREAS.
C. EXTERIOR LIGHTING IS BROKEN UP INTO (2) SCHEDULED ZONES:
   1. CANOPY LIGHTING, WALL PACKS, SITE LIGHTING.
   2. BUILDING SIGNAGE LIGHTING

EMERGENCY LIGHTING CONTROL:

A. MULTIPLE FIXTURES/DRIVERS ARE USED TO MEET REQUIRED EGRESS PATH ILLUMINATION.
B. EXTERIOR LIGHTING CONTROL IS VIA SCHEDULED TIME CONTROL / PHOTOCELL.
C. EXTERIOR EMERGENCY LIGHTING IS VIA BACKUP BATTERY PACK AT FIXTURE. UPON LOSS OF NORMAL POWER BATTERY PACK WILL ENGAGE ON THOSE FIXTURES WITH BACKUP BATTERY PACKS.
D. LIFT BAY EMEGRENCY LIGHTING IS VIA BACKUP BATTERY PACK AT FIXTURE. UPON LOSS OF NORMAL POWER BATTERY PACK WILL ENGAGE ON THOSE FIXTURES WITH BACKUP BATTERY PACKS.

TIME SCHEDULES:

A. TIME SCHEDULES ARE TO BE DETERMINED BY THE OWNER. THIS SHALL BE COORDINATED AND DIRECTED BY OWNER AND INPUT BY THE LIGHTING PROGRAMMER.

INDIVIDUAL AREAS INTENT OF CONTROL:

- GROUP RESTROOMS: ON/OFF WALL KEY SWITCH WITH CEILING MOUNTED OCCUPANCY SENSORS (DUAL TECHNOLOGY). EMERGENCY LIGHTING SHALL SUPPLEMENT THIS AREA VIA BACKUP BATTERY PACKS.
- CORRIDORS/HALLWAYS: CEILING MOUNTED OCCUPANCY SENSORS WITH MANUAL SWITCHING. EMERGENCY LIGHTING SHALL SUPPLEMENT THIS AREA VIA BACKUP BATTERY PACKS.
- LOBBY: CEILING MOUNTED OCCUPANCY SENSORS WITH MANUAL SWITCHING. EMERGENCY LIGHTING SHALL SUPPLEMENT THIS AREA VIA BACKUP BATTERY PACKS.
- INDIVIDUAL RESTROOMS: ON/OFF WALL SWITCH VACANCY SENSORS (PASSIVE INFRARED.)
- ELECTRICAL ROOMS, MECHANICAL ROOMS, ETC.: MANUAL ON/OFF SWITCH ONLY FOR PERSONNEL SAFETY.
- LARGE STORAGE ROOMS: ON/OFF WALL SWITCH WITH CEILING MOUNTED OCCUPANCY SENSORS (DUAL TECHNOLOGY).
- SMALL STORAGE/UTILITY ROOMS: ON/OFF WALL SWITCH OCCUPANCY SENSORS (PASSIVE INFRARED).
- LARGE/OPEN OFFICES/: CEILING MOUNTED OCCUPANCY SENSORS WITH MANUAL ON/OFF/DIMMING SWITCHING. EMERGENCY LIGHTING SHALL SUPPLEMENT THIS AREA VIA BACKUP BATTERY PACKS.
- SMALL/PRIVATE OFFICES/: ON/OFF/DIMMING WALL SWITCH WITH OCCUPANCY SENSORS (PASSIVE INFRARED).
- EXTERIOR CANOPY LIGHTING: ON/OFF MANUAL SWITCH AND TIME SCHEDULE CONTROL.
- EXTERIOR WALL PACKS: ON/OFF MANUAL SWITCH AND TIME SCHEDULE CONTROL.
- CLASSROOMS: CEILING MOUNTED OCCUPANCY SENSORS WITH MANUAL ON/OFF/DIMMING SWITCHING FOR EACH ZONE. EMERGENCY LIGHTING SHALL SUPPLEMENT THIS AREA VIA BACKUP BATTERY PACKS.
  1. ZONE #1 - CONTROLS FIXTURES (ON/OFF/DIM) AT TEACHING WALL.
  2. ZONE #2 - CONTROLS ALL OTHER FIXTURES (ON/OFF/DIM) IN THE ROOM.
- LIFT BAYS: MANUAL ON/OFF/DIMMING SWITCHING FOR EACH ZONE. EMERGENCY LIGHTING SHALL SUPPLEMENT THIS AREA VIA LIGHTING INVERTERS.
  1. ZONE #1 - CONTROLS FIXTURES (ON/OFF/DIM) AT NOTED ZONE.
  2. ZONE #2 - CONTROLS FIXTURES (ON/OFF/DIM) AT NOTED ZONE.
  3. ZONE #3 - CONTROLS FIXTURES (ON/OFF/DIM) AT NOTED ZONE.

FIXTURE NOTES (ADDITIONAL, ALL DEVICES AND INSTALLATION BELOW SHALL NOT BE SUPPLIED OR INSTALLED UNTIL DIRECTION FROM OWNER OR ENGINEER. THE BELOW SHALL BE PART OF THE BASE BID):

A. E.C. TO PROVIDE (2) ADDITIONAL TYPE 'DL1', DL2', & 'VTL1' FIXTURES AND INSTALLATION OF UP TO 100' (EACH FIXTURE) FROM LOCAL PANEL.
B. E.C. TO PROVIDE (2) ADDITIONAL TYPE 'HBL1' FIXTURES AND INSTALLATION OF UP TO 200' (EACH) FROM LOCAL PANEL.
C. E.C. TO PROVIDE (2) ADDITIONAL TYPE 'PL1', RL1', & 'RL2" FIXTURES AND INSTALLATION OF UP TO 100' (EACH) FROM LOCAL PANEL.
D. E.C. TO PROVIDE (1) ADDITIONAL TYPE 'OEM4" & 'OWL1' FIXTURES AND INSTALLATION OF UP TO 200' (EACH) FROM LOCAL PANEL.
E. E.C. TO PROVIDE (2) ADDITIONAL EXIT SIGNS ('EX1B' & 'EX1BE') AND INSTALLATION OF UP TO 100' (EACH EXIT SIGN) FROM LOCAL PANEL.
F. E.C. TO PROVIDE (2) SWITCHES ADDITIONAL AND RE-LOCATE (2) SWITCHES A TOTAL DISTANCE OF 10' (EACH) FROM EXISTING LOCATION POST INSTALLATION AS REQUIRED BY OWNER.
G. ARCHITECT TO APPROVE ALL EXTERIOR FIXTURE LOCATIONS. E.C. TO MARK OFF LOCATIONS WITH TEMPORARY "CHALK" OUTLINE AND PLAN FOR ARCHITECT ON-SITE APPROVAL OF LOCATIONS BEFORE INSTALLATION. E.C. TO CONTACT ARCHITECT WITH (1) WEEK PRIOR NOTICE.
H. E.C. TO PROVIDE (2) ADDITIONAL POWER PACKS AND INSTALLATION OF UP TO 200' (EACH) FROM LOCAL PANEL.
I. E.C. TO PROVIDE (2) ADDITIONAL SWITCHES OF EACH TYPE SPECIFIED FROM PROJECT.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MINIMUM LUMENS	CCT	TOTAL FIXURE WATTAGE	DRIVER	VOLTAGE	MANUFACTURER	MODEL	REMARKS	EXAMPLE
DL0	4" EXTERIOR SHALLOW RECESSED LED DOWNLIGHT	1,500	4000K	16.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	GOTHAM LITHONIA PRESCOLITE ELITE PORTFOLIO	IVO 4 APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL APPROVED EQUAL	SHALLOW DEPTH FIXTURE DLC/ENERGY STAR LISTED VERIFY FINISH/TRIM COLOR WITH ARCHITECT PROVIDE WITH INTEGRAL 90 MIN. BATTERY WHERE NOTED ON PLANS. INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS	
DL1	6" INTERIOR RECESSED LED DOWNLIGHT	1,500	3500K	15.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	GOTHAM LITHONIA PRESCOLITE ELITE PORTFOLIO	EVO6 LDN6 LTR-6RD HH6 LD6B	DLC/ENERGY STAR LISTED VERIFY FINISH/TRIM COLOR WITH ARCHITECT PROVIDE WITH INTEGRAL 90 MIN. BATTERY WHERE NOTED ON PLANS. INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS	
DL2	6" INTERIOR RECESSED LED DOWNLIGHT	2,000	3500K	21.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	GOTHAM LITHONIA PRESCOLITE ELITE PORTFOLIO	EVO6 LDN6 LTR-6RD HH6 LD6B	DLC/ENERGY STAR LISTED VERIFY FINISH/TRIM COLOR WITH ARCHITECT PROVIDE WITH INTEGRAL 90 MIN. BATTERY WHERE NOTED ON PLANS. INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS	
EX1B	THERMOPLASTIC EXIT SIGN (BATTERY BACKUP)		3500K	1.0 W	INTEGRAL LED DRIVER	UNIV	LITHONIA LIGHTALARMS DUAL-LITE MULE SURE-LITES	LQM QLX WPREM MX LPX	SEE PLANS FOR FACE STYLE AND QTY 90 MIN. INTEGRAL NICKEL CADMIUM BATTERY INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS UL LISTED FOR DAMP LOCATIONS VERIFY LETTER COLOR WITH ARCHITECT	
EX1BE	CLEAR EDGE-LIT EXIT SIGN (BATTERY BACKUP)		3500K	1.0 W	INTEGRAL LED DRIVER	UNIV	LITHONIA LIGHTALARMS DUAL-LITE MULE SURE-LITES	LRP SLED *LSNX CEL EUX	SEE PLANS FOR FACE STYLE AND QTY 90 MIN. INTEGRAL NICKEL CADMIUM BATTERY INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS UL LISTED FOR DAMP LOCATIONS VERIFY LETTER COLOR WITH ARCHITECT	
HBL1	LED ROUND LOW BAY	18,000	4000K	135.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	LITHONIA CREE METALUX SPECTRUM	JCBL KBL RHB DLD22GZ	PENDANT STEM MOUNTED FIXTURE WITH AIRCRAFT CABLE FOR SAFETY. PROVIDE UNISTRUT BETWEEN STRUCTURAL BRACING VERIFY FINISHES AND REFLECTOR/LENSE STYLE WITH ARCHITECT. DLC LISTED PROVIDE WITH INTEGRAL 90 MIN. BATTERY WHERE NOTED ON PLANS. INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS	
OEM4	EXTERIOR EMERGENCY EGRESS WALL PACK (LOW PROFILE)	635	4000K	17.0 W	INTEGRAL LED DRIVER	UNIV	DUAL-LITE LITHONIA ISOLITE LIGHTALARMS MULE	PG AFF OWL CAMRAY MERU	FIXTURE SHALL HAVE REDUNDANT LED'S AND/OR DRIVERS; LS CODE 101 COMPLIANT 90 MIN. INTEGRAL NICKEL CADMIUM BATTERY INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS UL LISTED WET LOCATION VERIFY FINISHES WITH ARCHITECT	
OWL1	EXTERIOR LED WALL PACK	6,000	4000K	50.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	LITHONIA RAYON HUBBELL BROWNLEE MCGRAW-EDISON	WST LED T630LEDB TRP1 7039-C49 IST	LS 101 EMERGENCY COMPLIANT UL LISTED WET LOCATION VERIFY FINISHES WITH ARCHITECT	
PL1	DECORATIVE SUSPENDED PENDANT	825	3500K	11.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	OCL ARCHITECTURAL MARK ARCHITECTURAL PEERLESS	GS1 APPROVED EQUAL APPROVED EQUAL	FIXTURE TO BE SUSPENDED VIA POWER CHORD FROM SURFACE MOUNTED CANOPY BOX. PROVIDE RIGID STEM MOUNT OPTION TO REDUCE SWAYING FROM AIRFLOW. VERIFY PENDANT SUSPENSION LENGTH, FIXTURE LENGTH, AND ALL FINISHES WITH ARCHITECT	
RL1	RECESSED LINEAR LED	7,600	3500K	57.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	LITHONIA FOCAL POINT LUMENWERX	SLOT 1 SEEM 1 LUMENWERX	400 LM/FT MINIMUM (3W/FT) PROVIDE WITH ASYMMETRIC/WALL WASH OPTICS FOR ILLUMINATING WALL FEATURE. VERIFY FIXTURE FINISHES, LENSE OPTIONS, MOUNTING TYPES, AND RUN LENGTHS WITH ARCHITECT. DLC LISTED	
RL2	RECESSED LINEAR LED	4,000	3500K	30.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	LITHONIA FOCAL POINT LUMENWERX	SLOT 1 SEEM 1 LUMENWERX	400 LM/FT MINIMUM (3W/FT) PROVIDE WITH WALL GRAZE OPTICS FOR ILLUMINATING INSIDE DISPLAY CABINET. VERIFY FIXTURE FINISHES, LENSE OPTIONS, MOUNTING TYPES, AND RUN LENGTHS WITH ARCHITECT. DLC LISTED	
STL1	4 FT. LED STRIP	5,000	3500K	42.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	LITHONIA COLUMBIA CREE COOPER DAY-BRITE	CLX LED FSS LCL 4-QC1 SNLED	PROVIDE CHAIN FOR PENDANT MOUNTING PROVIDE WIRE GUARD LENSED DLC LISTED PROVIDE WITH INTEGRAL 90 MIN. BATTERY WHERE NOTED ON PLANS. INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS	
STL2	4 FT. LED STRIP (WALL MOUNTED)	10,000	3500K	70.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	LITHONIA COLUMBIA CREE COOPER DAY-BRITE	CLX LED FSS LCL 4-QC1 SNLED	WALL MOUNTED AT 14' CONFIRM MOUNTING HEIGHT WITH ARCHITECT AND OWNER PRIOR TO INSTALL. PROVIDE WIRE GUARD LENSED DLC LISTED PROVIDE WITH INTEGRAL 90 MIN. BATTERY WHERE NOTED ON PLANS. INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS	
VLT1	2'X2' VOLUMETRIC LED TROFFER	4,000	3500K	27.0 W	INTEGRAL LED DRIVER (STANDARD 0-10V DIMMING)	UNIV	LITHONIA SAYLITE COLUMBIA ELITE METALUX	2VTL2 CBF LCAT22 22OVHPLED 22CZ2	DLC/ENERGY STAR LISTED VERIFY FINISH/TRIM COLOR WITH ARCHITECT PROVIDE WITH INTEGRAL 90 MIN. BATTERY WHERE NOTED ON PLANS. INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS	

NOTE: IF MINIMUM LUMENS IS EQUAL TO "0", THE CELL WILL BE FILLED IN SOLID BLACK SHADING.

LIGHTING FIXTURE SCHEDULE NOTES:

1. ALL FIXTURES SHALL BE LED UNLESS OTHERWISE SPECIFIED. COLOR TEMPERATURE SHALL BE 3500K FOR INTERIOR FIXTURES AND 4000K FOR EXTERIOR FIXTURES, UNLESS OTHERWISE NOTED.
2. LED DRIVERS SHALL BE PROVIDED FROM PER MANUFACTURER RECOMMENDATION. AS PART OF THIS RECOMMENDATION COORDINATE THE REQUIRED WAVE OUTPUT SO THEY ARE COMPATIBLE. THIS INCLUDES EMERGENCY DRIVERS.
3. SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT FIXTURE LOCATIONS.
4. FIXTURES IN FIRE RATED CEILING SHALL BE PROVIDED WITH FIRE RATED TENTS AS REQUIRED.
5. SUSPEND ALL FOUR CORNERS WITH WIRE TO STRUCTURE. DO NOT ALLOW GRID ALONE TO SUPPORT FIXTURE.
6. FIXTURES WITH EMERGENCY BATTERY PACKS SHALL BE SUPPLIED WITH 1100 LUMEN INVERTERS.
7. PROVIDE INTEGRAL SURGE PROTECTION ON ALL EXTERIOR LED DRIVER FIXTURE TYPES.
8. DIMMING OF FIXTURES SHALL BE WITH A SWITCH AS RECOMMENDED BY THE DRIVER MANUFACTURER.
9. THE CONTRACTOR SHALL VERIFY THE LEAD TIME OF ALL PRODUCTS SPECIFIED IN THIS SCHEDULE AT THE TIME OF PACKAGE QUOTE.
10. DURING THE BID PROCESS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DELIVERY/SCHEDULING ISSUES.
11. NO SUBSTITUTIONS WILL BE ALLOWED DUE TO LACK OF COORDINATION OF DELIVERY DATES AND CONSTRUCTION SCHEDULE AFTER BID.
12. ALL EXPEDITED EXPENSES SHALL BE THE RESPONSIBILTY OF THE CONTRACTOR.
13. FIXTURES TO BE INSTALLED IN CEILINGS, INDICATED ON ARCHITECTURAL PLANS AS HAVING INSULATION IN CONTACT WITH CEILING SURFACE, SHALL BE IC RATED BY MANUFACTURER.
14. LED DRIVERS LOCATED IN UNCONDITIONED SPACES SHALL BE RATED FOR 90 DEGREES F.
15. PROVIDE 90 MINUTE EMERGENCY BATTERY BACK UP. EMERGENCY BACK UP SHALL BE BASED ON TYPE OF FIXTURE, LED DRIVER, BALLAST, ETC. EMERGENCY BACKUP SHALL BE DUAL INPUT FOR BOTH SWITCHING AND CHARGING. PROVIDE UNSWITCHED "HOT" FROM LOCAL CIRCUIT UNLESS OTHERWISE INDICATED ON PLANS. PROVIDE WITH INDICATOR LIGHT. INSTALL LED INDICATOR ON LIGHT FIXTURE UNLESS DECORATIVE. DECORATIVE FIXTURES SHALL HAVE INDICATOR PLACED AT LOCAL CEILING. BODINE, PHILLIPS, POWER SENTRY OR EQUAL. INTEGRAL TEST SWITCH PROVIDED; SELF TESTING-DIAGONISTICS
16. LIGHT FIXTURE BATTERIES TO BE A HIGH TEMPERATURE TYPE WITH AN OPERATING RANGE OF 0-DEGREE C TO 60-DEGREE C AND WHERE OPERATED IN COLD ENVIRONMENTS TO HAVE LOW TEMPERATURE OPTION.
17. ALL FIXTURES IN HARD CEILING SPACES SHALL BE "ACCESSIBLE FROM BELOW" IN ACCESSING DRIVER AND PERFORMING MAINTENANCE AND REPAIRS/REPLACEMENT OF ALL PARTS.

LIGHTING (SPECIFIED)

TYPE	FIXTURE WATTS	MULT	FIXTURE COUNT	EQUALS	TOTAL FIXTURE TYPE WATT (W)
DL0	16.0 W	X	12	=	192.00
DL1	15.0 W	X	14	=	210.00
DL2	21.0 W	X	31	=	651.00
EX1B	1.0 W	X	7	=	7.00
EX1BE	1.0 W	X	2	=	2.00
HBL1	135.0 W	X	26	=	3510.00
OEM4	17.0 W	X	2	=	34.00
OWL1	50.0 W	X	3	=	150.00
PL1	11.0 W	X	10	=	110.00
RL1	57.0 W	X	1	=	57.00
RL2	30.0 W	X	1	=	30.00
STL1	42.0 W	X	2	=	84.00
STL2	70.0 W	X	1	=	70.00
VLT1	27.0 W	X	53	=	1431.00
TOTAL BUILDING ACCUMULATED FIXTURE WATTAGE (SPECIFIED) =					6538.00

Opt # 23-0128

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3/3/25

RICHMOND COMMUNITY COLLEGE HENDRICK CENTER FOR AUTOMOTIVE TRAINING

1042 Hamlet Ave,
Hamlet, NC 28345

BID DOCUMENTS

LIGHTING FIXTURES + MECHANICAL EQUIPMENT CONNECTION SCHEDULE

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS

NO:	DATE:	DESCRIPTION:

SHEET NUMBER

E801

PANEL: MDP

VOLTAGE: 480Y/277 3Ø | FED FROM: UTILITY TRANSFORMER
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 400 A | WIRE: 4 | AIC: 42 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
MS	SPD	-	60 A	1	3	0.00	11.55					3	2	125 A	1	PANEL "RP1" VIA 75 KVA TRANSFORMER TXRP1	F
				3				0.00	13.65				4				
				5						0.00	14.08		6				
R	PANEL "H1"	4/0	225 A	7	3	21.60	3.39					3	8	20 A	12	RTU-1	H
				9				17.49	3.39				10				
				11						17.40	3.39		12				
H	RTU-2	12	20 A	13	3	3.19	5.56					3	14	30 A	10	RTU-3	H
				15				3.19	5.56				16				
				17						3.19	5.56		18				
H	RTU-4	12	20 A	19	3	3.39	8.11					3	20	45 A	6	RTU-5	H
				21				3.39	8.11				22				
				23						3.39	8.11		24				
Spare	SPARE	-	225 A	25	3	0.00	1.76					1	26	20 A	12	LIGHTS - OFFICES, GENERAL	L
				27				0.00	1.17			1	28	20 A	12	LIGHTS - LABS, STORAGE	L
				29						0.00	0.42	1	30	20 A	10	LIGHTS - EXTERIOR (NOTE 9)	L
Spare	SPARE	-	125 A	31	3	0.00	0.00					1	32	20 A	-	SPARE	Sp...
				33				0.00	0.00			1	34	20 A	-	SPARE	Sp...
				35						0.00	0.00	1	36	20 A	-	SPARE	Sp...
Spare	SPARE	-	60 A	37	3	0.00	0.00					1	38	20 A	-	SPARE	Sp...
				39				0.00	0.00			1	40	20 A	-	SPARE	Sp...
				41						0.00	0.00	1	42	20 A	-	SPARE	Sp...

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	6.73 kVA	125.00%	8.42 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	47.63 kVA	100.00%	47.63 kVA
C	COOLING	1.70 kVA	100.00%	1.70 kVA
V	VENTILATION	2.17 kVA	100.00%	2.17 kVA
M	MOTORS	16.00 kVA	100.00%	16.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	25.30 kVA	69.76%	17.65 kVA
WH	WATER HEATER	4.50 kVA	100.00%	4.50 kVA
MS	MISC.	41.71 kVA	100.00%	41.71 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. THIS PANEL SHALL BE U.L. LISTED FOR USE AS S.E. EQUIP.
8. PROVIDE "ALL MODES" SPD (40kA / MODE, 80kA / PHASE).
9. CIRCUIT CONTROLLED VIA CONTACTOR/TIME CLOCK.

TOTAL KVA...	170.08 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	164.12 kVA	211.6 A	202.3 A	200.6 A
TOTAL AMP....	205 A			
TOTAL AMP. (DEMAND):	197 A	TOTAL AMP. (DEMAND) x 125%		246.8 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: RP1

VOLTAGE: 208Y/120 3Ø | FED FROM: TXRP1
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 250 A | WIRE: 4 | AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
MS	DATA RACK - ELECT 108	12	20 A	1	1	1.50	0.50					1	2	20 A	12	FACP - ELECT 108 (NOTE 7,8)	MS
MS	TELE. BOARD - ELECT 108	12	20 A	3	1			1.00	0.50			1	4	20 A	12	BDA - ELECT 108 (NOTE 7,8)	MS
MS	TELE. BOARD - ELECT 108	12	20 A	5	1					1.00	0.50	1	6	20 A	12	BDA - ELECT 108 (NOTE 7,8)	MS
MS	BAS - ELECT 108	12	20 A	7	1	1.00	0.50					1	8	20 A	12	TIME CLOCK - TC1	MS
R	REC - ELECT 108	12	20 A	9	1			0.18	1.00			1	10	20 A	12	SIGNAGE JUNCTION BOX - NOTE...	MS
R	REC - JAN 109, RESTROOMS	12	20 A	11	1					0.54	1.00	1	12	20 A	12	SIGNAGE JUNCTION BOX - NOTE...	MS
MS	REC - WOMEN'S FAUCET	12	20 A	13	1	0.75	1.00					1	14	20 A	10	SIGNAGE JUNCTION BOX - NOTE...	MS
MS	REC - MEN'S FAUCET	12	20 A	15	1			0.75	0.72			1	16	20 A	12	REC - ADMIN 102	R
MS	EWC - CORRIDOR 105 (NOTE 9)	12	20 A	17	1					1.00	0.90	1	18	20 A	12	REC - ADMIN 102	R
R	REC-MAIN LOBBY 101(FLOORBOXES)	12	20 A	19	1	0.54	1.00					1	20	20 A	12	COPIER - ADMIN 102	MS
R	REC - MAIN LOBBY 101	12	20 A	21	1			0.54	0.90			1	22	20 A	12	REC - OFFICE 103	R
H	BACKFLOW - DOMESTIC	12	20 A	23	1					1.00	0.90	1	24	20 A	12	REC - OFFICE 104	R
M	RCP1 - JAN 109	12	15 A	25	1	0.13	0.18					1	26	15 A	12	FAN F-1	V
WH	WATER HEATER WH1	10	30 A	27	2			2.25	1.18			1	28	20 A	12	FAN F-2	V
				29						2.25	0.79	1	30	20 A	12	FAN F-3	V
C	IDU-1, ODU-1	12	20 A	31	2	0.85	0.00					1	32	20 A	-	SPARE	Sp...
				33				0.85	0.00			1	34	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	35	1					0.00	0.00	1	36	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	37	1	0.00	3.60					3	38	125 A	1	PANEL "RP2"	F
Sp...	SPARE	-	20 A	39	1			0.00	3.78				40				
Sp...	SPARE	-	20 A	41	1					0.00	4.20		42				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	1.00 kVA	100.00%	1.00 kVA
C	COOLING	1.70 kVA	100.00%	1.70 kVA
V	VENTILATION	2.15 kVA	100.00%	2.15 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	16.80 kVA	79.76%	13.40 kVA
WH	WATER HEATER	4.50 kVA	100.00%	4.50 kVA
MS	MISC.	13.13 kVA	100.00%	13.13 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.
7. PROVIDE BREAKER WITH HANDLE LOCK-ON DEVICE.
8. BREAKER SHALL BE PAINTED RED.
9. PROVIDE CLASS A GFI (6mA-PERSONNEL) BRKR (250' MAX).
10. CIRCUIT CONTROLLED VIA CONTACTOR/TIME CLOCK.

TOTAL KVA...	39.28 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	35.88 kVA	96.3 A	116.4 A	120.0 A
TOTAL AMP....	109 A			
TOTAL AMP. (DEMAND):	100 A	TOTAL AMP. (DEMAND) x 125%		124.5 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: RP2

VOLTAGE: 208Y/120 3Ø | FED FROM: RP1
MOUNTING: SURFACE | MAIN TYPE: MLO | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 125 A | WIRE: 4 | AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
R	REC - EXTERIOR	12	20 A	1	1	0.54	0.54					1	2	20 A	12	REC-AUTO SIM LAB A 110(TEACHING)	R
R	REC - CORRIDOR 105	12	20 A	3	1			0.54	0.72			1	4	20 A	12	REC - AUTO SIM LAB A 110	R
R	REC - ROOF	12	20 A	5	1					0.54	0.72	1	6	20 A	12	REC - AUTO SIM LAB A 110	R
R	REC - ROOF	12	20 A	7	1	0.54	0.72					1	8	20 A	12	REC - AUTO SIM LAB A 110	R
R	REC - AUTO SIM STORAGE 111	12	20 A	9	1			0.36	0.72			1	10	20 A	12	REC - AUTO SIM LAB A 110	R
MS	REC - ELECTRIC STACKER CHARGER	12	20 A	11	1					1.50	0.72	1	12	20 A	12	REC - AUTO SIM LAB A 110	R
Sp...	SPARE	-	20 A	13	1	0.00	0.54					1	14	20 A	12	REC-AUTO SIM LAB B 112(TEACHING)	R
Sp...	SPARE	-	20 A	15	1			0.00	0.72			1	16	20 A	12	REC - AUTO SIM LAB B 112	R
Sp...	SPARE	-	20 A	17	1					0.00	0.72	1	18	20 A	12	REC - AUTO SIM LAB B 112	R
Sp...	SPARE	-	20 A	19	1	0.00	0.72					1	20	20 A	12	REC - AUTO SIM LAB B 112	R
Sp...	SPARE	-	20 A	21	1			0.00	0.72			1	22	20 A	12	REC - AUTO SIM LAB B 112	R
Sp...	SPARE	-	20 A	23	1					0.00	0.00	1	24	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	25	1	0.00	0.00					1	26	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	27	1			0.00	0.00			1	28	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	29	1					0.00	0.00	1	30	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	31	1	0.00	0.00					1	32	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	33	1			0.00	0.00			1	34	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	35	1					0.00	0.00	1	36	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	37	1	0.00	0.00					1	38	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	39	1			0.00	0.00			1	40	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	41	1					0.00	0.00	1	42	20 A	-	SPARE	Sp...

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	0.00 kVA	0.00%	0.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	10.08 kVA	99.60%	10.04 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	1.50 kVA	100.00%	1.50 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	11.58 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	11.54 kVA	30.0 A	31.7 A	35.2 A
TOTAL AMP....	32 A			
TOTAL AMP. (DEMAND):	32 A	TOTAL AMP. (DEMAND) x 125%		40.0 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: H1

VOLTAGE: 480Y/277 3Ø | FED FROM: MDP
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 225 A | WIRE: 4 | AIC: 22 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
M	(AC) AIR COMPRESSOR - 5HP	12	20 A	1	3	4.21	3.38					1	2	20 A	12	LIGHTS - LIFT BAYS 114	L
				3				4.21	0.00			1	4	20 A	-	SPARE	Sp...
				5						4.21	0.00	1	6	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	7	1	0.00	0.00					1	8	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	9	1			0.00	0.00			1	10	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	11	1					0.00	0.00	1	12	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	13	1	0.00	0.00					1	14	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	15	1			0.00	0.00			1	16	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	17	1					0.00	0.00	1	18	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	19	1	0.00	0.00					1	20	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	21	1			0.00	0.00			1	22	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	23	1					0.00	0.00	1	24	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	25	1	0.00	0.00					1	26	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	27	1			0.00	0.00			1	28	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	29	1					0.00	0.00	1	30	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	31	1	0.00	0.00					1	32	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	33	1			0.00	0.00			1	34	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	35	1					0.00	0.00	1	36	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	37	1	0.00	14.00					3	38	125 A	1	PANEL "SP1" VIA 75 KVA TRANSFORMER TXSP1	F
Sp...	SPARE	-	20 A	39	1			0.00	13.28				40				
Sp...	SPARE	-	20 A	41	1					0.00	13.19		42				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	3.38 kVA	125.00%	4.23 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.02 kVA	100.00%	0.02 kVA
M	MOTORS	16.00 kVA	100.00%	16.00 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	8.50 kVA	100.00%	8.50 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	28.58 kVA	100.00%	28.58 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	56.48 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	57.33 kVA	78.0 A	63.2 A	62.8 A
TOTAL AMP....	68 A			
TOTAL AMP. (DEMAND):	69 A	TOTAL AMP. (DEMAND) x 125%		86.2 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: SP1

VOLTAGE: 208Y/120 3Ø | FED FROM: TXSP1
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 250 A | WIRE: 4 | AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
V	FAN F-4	12	15 A	1	1	0.02	1.12					1	2	20 A	12	BAY DOOR MOTOR - LIFT BAYS 114	M
R	REC - TOOLS 115	12	20 A	3	1			0.18	0.60			1	4	20 A	12	(AD) AIR DRYER - EQUIP STOR 113	MS
MS	FLUID DEFENDER CONTROL BOX	12	20 A	5	1					0.25	1.00	1	6	20 A	12	(AU) AIR UTILITY BOX - LIFT BAYS 114	MS
R	REC - TOOL BOX - LIFT BAYS 114	12	20 A	7	1	1.50	1.75					1	8	20 A	12	BATTERY CHARGER - LIFT BAYS 114	MS
R	REC - EXTERIOR	12	20 A	9	1			0.72	1.50			1	10	20 A	12	REC - TOOL BOX - LIFT BAYS 114	R
MS	(BL) BRAKE LATHE - LIFT BAYS 114	12	20 A	11	1					1.80	0.24	1	12	20 A	12	(TM) TANK MONITOR - LIFT BAYS 114	MS
MS	(ED) ELECTRIC DRAIN - EQUIP STO...	12	20 A	13	1	0.24	0.36					1	14	20 A	12	REC - EQUIP STOR 113	R
MS	(LP1) 2 POST LIFT - LIFT BAYS 114	12	20 A	15	2			1.38	0.24			1	16	20 A	12	(TM) TANK MONITOR - EQUIP STOR...	MS
				17						1.38	0.36	1	18	20 A	12	REC - TOOLS 115	R
MS	ACS MACHINE - LIFT BAYS 114	12	20 A	19	1	1.00	1.00					1	20	20 A	12	ACS MACHINE - LIFT BAYS 114	MS
R	REC - TOOLS 115	12	20 A	21	1			0.36	0.54			1	22	20 A	12	REC - LIFT BAY 114	R
R	REC - TECH CARTS - LIFT BAYS 114	12	20 A	23	1					1.00	0.54	1	24	20 A	12	REC - LIFT BAY 114	R
R	REC - LIFT BAY 114	12	20 A	25	1	0.18	0.18					1	26	20 A	12	REC - LIFT BAY 114	R
Sp...	SPARE	-	20 A	27	1			0.00	0.00			1	28	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	29	1					0.00	0.00	1	30	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	31	1	0.00	0.00					1	32	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	33	1			0.00	0.00			1	34	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	35	1					0.00	0.00	1	36	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	37	1	0.00	6.65					3	38	125 A	1	PANEL "SP2"	F
Sp...	SPARE	-	20 A	39	1			0.00	7.76				40				
Sp...	SPARE	-	20 A	41	1					0.00	6.62		42				

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.02 kVA	100.00%	0.02 kVA
M	MOTORS	3.36 kVA	100.00%	3.36 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	8.50 kVA	100.00%	8.50 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	28.58 kVA	100.00%	28.58 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	40.46 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	40.46 kVA	116.8 A	110.7 A	109.9 A
TOTAL AMP....	112 A			
TOTAL AMP. (DEMAND):	112 A	TOTAL AMP. (DEMAND) x 125%		140.4 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: SP2

VOLTAGE: 208Y/120 3Ø | FED FROM: SP1
MOUNTING: SURFACE | MAIN TYPE: MCB | MFR:
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE:
MAIN: 125 A | WIRE: 4 | AIC: 10 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
MS	(AM) ALIGN MACHINE - LIFT BAYS 114	12	20 A	1	1	0.50	0.60					1	2	20 A	12	REC - MOBILE LIFT CHARGER - LIFT...	MS
R	REC - LIFT BAY 114	12	20 A	3	1			0.54	0.54			1	4	20 A	12	REC - LIFT BAY 114	R
MS	OIL INTERCEPTOR CONTROL PANEL	12	20 A	5	1					0.50	1.00	1	6	20 A	12	(AU) AIR UTILITY BOX - LIFT BAYS 114	MS
M	BAY DOOR MOTOR - LIFT BAYS 114	12	20 A	7	1	1.12	1.12					1	8	20 A	12	BAY DOOR MOTOR - LIFT BAYS 114	M
MS	(WB) WHEEL BALANCER - LIFT BAYS 114	12	20 A	9	2			1.04	1.38			2	10	20 A	12	(LP1) 2 POST LIFT - LIFT BAYS 114	MS
				11						1.04	1.38		12				
MS	FLOOR SCRUBBER - LIFT BAYS 114	12	20 A	13	1	1.75	1.56					2	14	20 A	12	(TC1) TIRE CHANGER - LIFT BAYS 114	MS
MS	(ALP) ALIGN LIFT RACK -LIFT BAYS 114	8	40 A	15	2			2.71	1.56				16				
				17						2.71	0.00	1	18	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	19	1	0.00	0.00					1	20	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	21	1			0.00	0.00			1	22	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	23	1					0.00	0.00	1	24	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	25	1	0.00	0.00					1	26	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	27	1			0.00	0.00			1	28	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	29	1					0.00	0.00	1	30	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	31	1	0.00	0.00					1	32	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	33	1			0.00	0.00			1	34	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	35	1					0.00	0.00	1	36	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	37	1	0.00	0.00					1	38	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	39	1			0.00	0.00			1	40	20 A	-	SPARE	Sp...
Sp...	SPARE	-	20 A	41	1					0.00	0.00	1	42	20 A	-	SPARE	Sp...

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0.00 kVA	0.00%	0.00 kVA
LE	LIGHTING - EXTERIOR	0.00 kVA	0.00%	0.00 kVA
H	HEATING	0.00 kVA	0.00%	0.00 kVA
C	COOLING	0.00 kVA	0.00%	0.00 kVA
V	VENTILATION	0.00 kVA	0.00%	0.00 kVA
M	MOTORS	2.24 kVA	100.00%	2.24 kVA
K	KITCHEN	0.00 kVA	0.00%	0.00 kVA
R	RECEPTACLES	1.08 kVA	100.00%	1.08 kVA
WH	WATER HEATER	0.00 kVA	0.00%	0.00 kVA
MS	MISC.	17.71 kVA	100.00%	17.71 kVA
S	Spare	0.00 kVA	0.00%	0.00 kVA
E	ELEVATOR	0.00 kVA	0.00%	0.00 kVA
LD	LAUNDRY	0.00 kVA	0.00%	0.00 kVA
EV	EV CHARGING	0.00 kVA	0.00%	0.00 kVA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. PROVIDE HINGED DOOR-IN-DOOR WITH OUTER DOOR LOCK.
6. PROVIDE METAL DIRECTORY FRAME.

TOTAL KVA...	21.03 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	21.03 kVA	55.5 A	64.7 A	55.2 A
TOTAL AMP....	58 A			
TOTAL AMP. (DEMAND):	58 A	TOTAL AMP. (DEMAND) x 125%		73.0 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

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3/3/25

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BID DOCUMENTS

PANEL SCHEDULES

DATE: 3-3-2025
PROJECT NO: 23014

REVISIONS
NO: DATE: DESCRIPTION:

SHEET NUMBER
E802