Joe Frogge
Digitally signed by Joe Frogge
DN: C=US, O=Forge Construction Co, L=Kansas City, S=Missouri, CN=Joe Frogge
Reason: I am approving this document
Date: 2023.02.24 08:36:00 -06'00'

RELEASED FOR CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
02/28/2023

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architecture&engineering

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project description:

A new one story retail building for a hardware store

code review:

Governing municipality:	Lee's Summit, Missouri
governing code:	2018 IBC, 2018 IMC, 2018 IPC, 2018 IFGC, 2018 IFC, 2017 NEC, ADA.ANSI 117.1
zoning:	CP-2
construction:	5-B
stories:	1 story actual
building height:	60' allowed, 24'-8" actual
fire suppression:	yes (NFPA13) fire sprinkler and fire alarm system design drawings will be submitted as a deferred submittal
fire extinguishers:	provide for 75' maximum travel distance to extinguisher throughout building
occupancy group:	M (mercantile)
allowable building area:	36,000 sq. ft.
actual building area:	15,455 sq. ft.
covered front canopy:	1.206 sq. ft.
covered back canopy:	200 sq. ft.
fire resistance rating for exterior walls:	all exterior walls are min. 15' from property lines, 0 rating is required for type 5B

occupancy calculation:

mercantile	13,183 sq. ft. / 60 =	220 occupants
storeroom	1,598 sq. ft. / 300 =	5 occupants
office/toilets	513 sq. ft. / 150 =	3 occupants
break	161 sq. ft. / 15 =	11 occupants
total:	15,455 sq. ft.	239 occupants

restroom calculations:

toilets - 1:500	
men	1 required, 1 provided
women	1 required, 1 provided
lavatories - 1:750	
men	1 required, 1 provided
women	1 required, 1 provided
drink fountain - 1:1000	1 required, 2 provided (1 high/low unit)
service sink	1 required, 1 provided

exiting required: 239 x 0.2" = 48" exiting width required
exiting provided:
door 01 - 155" width
door 05 - 34" width
door 06 - 34" width
door 10 - 34" width
number of exits required: 2
number of exits provided: 3 at retail, 1 at stock room

exit access travel distance with sprinkler system is 250'. all travel distances within the building are less than 250'.

sheet index:

client:

Dan Carr
CBC Real Estate Group
4706 Broadway, Suite 240
Kansas City, Missouri 64112
p: 816.210.3728

STATE OF MISSOURI
POWELL EMERSON MINNIS
NUMBER A-6686
REGISTERED ARCHITECT
02.24.2023

civil engineer:

Dan Finn, P.E.
Phelps Engineering, Inc.
1270 N. Winchester
Olathe, Kansas 66062
p: 913.538-5821

architect:

Powell Minnis, R.A.
Davidson Architecture & Engineering
4301 Indian Creek Parkway
Overland Park, Kansas 66207
p: 913.451.9390 f: 913.451.9391

structural engineer:

Kevin Boehringer, P.E.
BSE Structural Engineers
11320 West 79th Street
Lenexa, Kansas 66214
p: 913.492.7400 f: 913.438.3773

mech./plumb. engineer:

Sunil Khadka, P.E. mechanical
Thomas Frieze, P.E. plumbing
BC Engineers, Inc.
5720 Reeder Street
Shawnee, Kansas 66203
p: 913.262.1772 f: 913.262.1773

electrical engineer:

Brett Hermann, P.E.
BC Engineers, Inc.
5720 Reeder Street
Shawnee, Kansas 66203
p: 913.262.1772 f: 913.262.1773

general contractor:

Forge Construction
1307 Union Avenue
Kansas City, Missouri 64101
p: 816.608.1800

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

A0.0
cover sheet

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symbol legend:

- door tag
- construction note
- partition type
- room name / room tag
- elevation
- wall section
- enlarged detail

partition legend:

P1 Insulated Partition:
6" metal studs @ 16" o.c. with 5/8" gypsum board on each side full height to underside of roof structure with deep leg slip track per detail and 6" unfaced sound attenuation insulation full height. Use 18 ga. studs for shelving support at south wall of corner offices.

P2 Insulated Partition:
3 5/8" metal studs @ 16" o.c. with 5/8" gypsum board on each side to 6" above ceiling and 3 1/2" unfaced sound attenuation insulation.

P3 Insulated Furred Partition:
3-5/8" metal studs @ 16" o.c. with 5/8" gypsum board on finish side to 6" above ceiling with 3 1/2" unfaced batt insulation.

P4 Insulated Partition:
6" metal studs @ 16" o.c. with 5/8" gypsum board on one side full height to under side of roof structure and 5/8" fire rated/treated plywood on the storeroom side up to 8'-0" and 5/8" gypsum board from 8'-0" full height to underside of roof structure with deep leg slip track per detail and 6" unfaced sound attenuation insulation full height. Use 18 ga. studs for shelving support.

P5 Insulated Partition:
6" metal studs @ 16" o.c. with 5/8" gypsum board on each side to 6" above ceiling and 6" unfaced sound attenuation insulation.

* Expansion Joint Note: Expansion joints shall be installed at a max. of 30'-0". Joints shall also be located to coordinate with anticipated building movement, structural elements, and substrate transitions.

* Wet Wall Note: Utilize DensArmor Plus in all plumbing wet walls and all walls adjacent to plumbing walls or where anticipated to be in contact with moisture.

* Wall Height Note: Utilize 3-5/8" metal studs at 16" o.c. to an un-braced height of 13'-8", at heights to 26'-0" use 6" (16 ga.) studs at 16" o.c.

* Refer to 3/A5.1 for slip track detail.

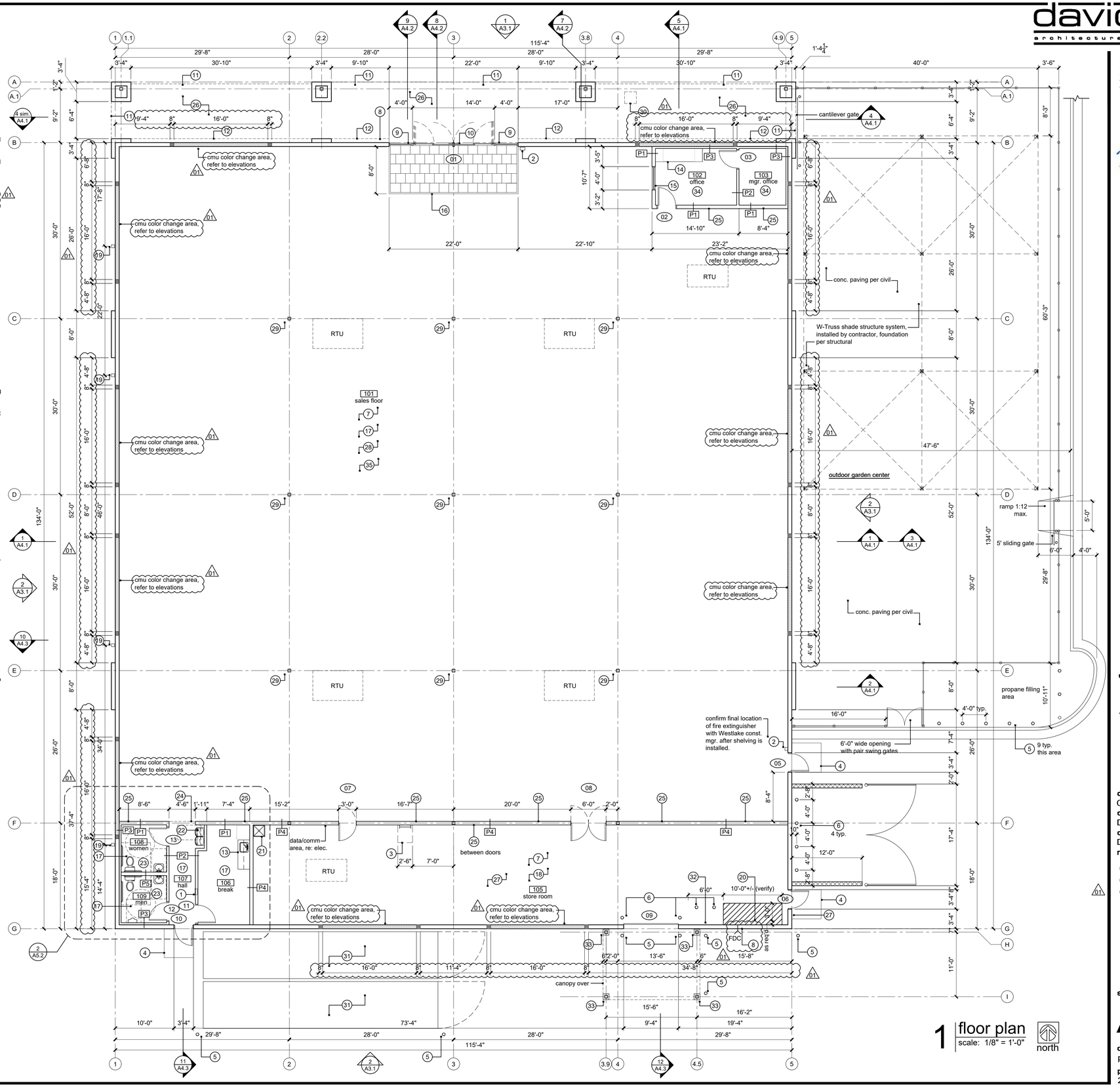
* All stud gauges as recommended by supplier or as specifically called out.

general notes

- All construction shall conform to the standards and regulations adopted by Lee's Summit, Kansas.
- The general contractor shall contact all utility companies prior to the start of construction and verify the location and depth of any utilities that may be encountered during construction.
- The contractor shall field verify exist. surface & subsurface ground conditions prior to start of construction.
- The contractor shall be responsible for obtaining all required permits, paying all fees, and otherwise complying with all applicable regulations governing the project.
- Double keyed locks are not permitted on any required or marked exit.
- Exit doors shall be open-able from the inside without the use of a key or any special knowledge or effort.
- Exit/emergency lighting shall be installed per electrical and is subject to an onsite inspection.
- Mechanical rooftop units shall have accessible GFCI outlet per code.
- Provide electrical outlets at 15" a.f.f. to the lowest outlet per ADA/ANSI.
- Egress illumination shall be provided at an intensity of not less than 1 foot candle at floor level and at the exterior of the building.
- All exterior utility service equipment shall be painted to match the adjacent building standard color.
- Furnish and install horns and strobes as required.
- All electrical outlets within 6' of any sink or water source shall be GFCI protected.
- Install address numbers on front and rear elevation of building in contrasting color to building color.

construction notes

1. Furnish and install semi-recessed fire extinguisher cabinet with white finish and vision panel in door, with (min. 5lb.) 3A-40BC fire extinguisher, bottom at 36" a.f.f. Coordinate location as directed by Fire Marshall.
2. Furnish and install surface wall mounted fire extinguisher cabinet with white finish and vision panel in door, with (min. 5lb.) 3A-40BC fire extinguisher, bottom at 36" a.f.f. Coordinate location as directed by Fire Marshall.
3. Furnish and install 30" x 36" roof hatch and ladder per detail. Coordinate with roof joist layout.
4. Furnish and install 5'x5' reinforced concrete stoop per structural details.
5. Furnish and install pea gravel conc. filled 6" dia. galv. steel pipe bollards, 4' high, with polyethylene covers, Reliance "Foundary Gray" with red reflective stripes.
6. Furnish and install pea gravel conc. filled 6" dia. galv. steel pipe bollards, 4' high, paint safety yellow.
7. Fill all contraction and construction joints in concrete slab in entire building with sealant, flush with floor elevation.
8. Furnish and install a Knox Box above FDC connection at 6'-0" above finish grade. Verify location with local fire department prior to installation.
9. Furnish and install window system - 1" clear insulated glass in thermally broken clear anodized aluminum storefront frames. Re A5.1 for window type.
10. Furnish and install automatic sliding entrance doors w/1" insul. clear glass in thermally broken clear anod. alum. storefront frames, re: A5.1 for enlarged elevations.
11. Line of soffit above.
12. Furnish and install 8" wide x 8" high concrete curb along exterior side of wall.
13. Furnish and install lower and upper plastic laminate casework @ 2'-10" a.f.f. with plastic laminate countertop and 4" backsplash. Provide adequate electrical and plumbing for garbage disposal, refrigerator and water supply line for ice maker.
14. Furnish and install a 2'-4" deep x 6'-3" wide laminate countertop, Wilsonart "Graphite Nebula", to be supported by 2-drawer file cabinets furnished by owner.
15. Furnish and install 4'x4' one way tempered viewing glass window in clear anod. alum. frame.
16. Furnish and install entry mat - Mats Inc., Diagonal Tile, color: gray, installed quarter turn with Release Bond adhesive. Install 2-3/4" aluminum transition edge to surrounding floor surfaces.
17. Concrete floor shall be diamond polished, ground hardened and finished to Level 3 semi-polish finish. During polishing process apply Prosoco LS Densifier and after polishing apply Prosoco Polish Guard per manufacturer's instruction. Contractor shall submit stain samples to tenant for selection. Refer to specification section 033543 Polished Concrete Finishing for additional information.
18. Apply 2 coats Ashford Clear hardener sealer to exposed concrete.
19. 6"x6" prefinished downspout, connect underground per civil.
20. Furnish and install 3/4" thick 4' x 8' fire rated/treated plywood on wall. Maintain 36" clear in front of electrical panels. See also electrical for additional information. Paint striped clear area in front of panels in safety yellow as shown, verify location in field.
21. Furnish and install janitor's mop basin with mop rack and FRP wall panels 4' high and 4' on each side of sink.
22. Furnish and install hi-lo ADA drinking fountain with bottle fill per MEP.
23. Furnish and install new restroom with 5' turning radius per ADA, wall mounted sink at 34" a.f.f. with wrist blade faucet, 36" & 42" horizontal grab bars at 33"-36" a.f.f. - 6" & 12" from corner respectively and 18" vertical grab bar per detail. Include toilet accessories per sheet A5.2. Refer to enlarged plans, elevations, and accessories list and install per ADA.
24. Line of soffit above, refer to RCP plan.
25. Furnish and install in wall partition - DanBack flexible wood blocking anchor system (3/4" CDX Douglas Fir fire retardant/treated wood) at 8'-0" and 12'-0". Heights are to top of anchoring block. Use 18 ga. wall studs.
26. Furnish and install 12" wide prefinished flat metal soffit panels, color white on 3 5/8" metal stud backup framing. Provide prefinished running trim at all edges.
27. Provide call button and bell system for freight delivery notification. Provide electrical as required.
28. Paint all exposed roof framing - metal decking, joists and structural beams above - acrylic flat dryfall paint.
29. Paint steel columns.
30. 2"x2" galv. metal soffit access door and frame for access to lighting circuits and LED drivers. Paint to match soffit panels. Install 4' wide treated plywood walkway above on stl. soffit framing studs running the length of the soffit to access lighting controls.
31. 40"-0" x 8'-0" container for covered and secured storage provided and placed by tenant.
32. Location of fire riser and water riser, see plumbing for additional information.
33. Steel framed canopy with conc. bases, see wall section details and structural for additional information. Paint all exposed steel to match building.
34. Install carpet tile as specified on A5.1 in offices, with transition strip to concrete floor where applicable.
35. Install 4" wall base in rooms 101, 102, 103 ,104, 105 and 107 per finish schedule A5.1. Install 4" wall base on shelving around perimeter of sales area after shelving has been installed by tenant.



1 floor plan
scale: 1/8" = 1'-0"
north

davidson architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com

STATE OF MISSOURI
POWELL EMERSON MINNIS
NUMBER A-6398
REGISTERED ARCHITECT

03.20.2023

a new store for Westlake ACE Hardware

3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.2022
drawn by
DAE
checked by
DAE
revisions

09.12.2022	PDP
02.24.2023	permit
03.20.2023	01

sheet number
A2.1

drawing type
permit

project number
22185

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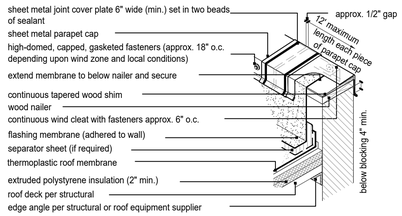
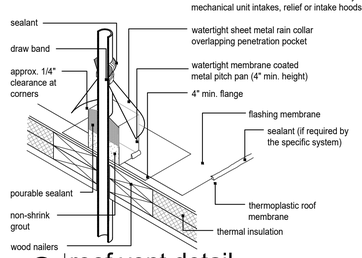
Lee's Summit, Missouri
03/20/2023

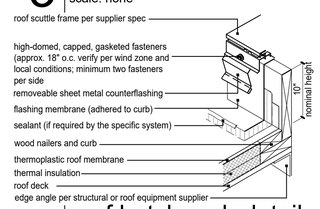


2 parapet cap detail
scale: none

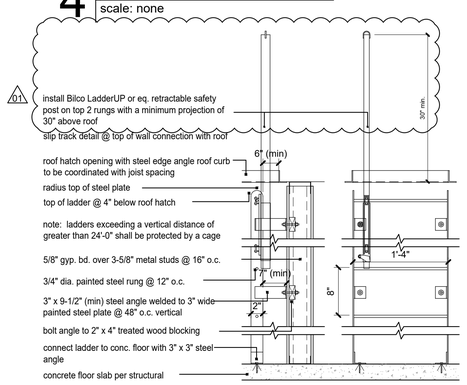
note: locate VTR a minimum of 10' from any building openings, mechanical unit intakes, relief or intake hoods



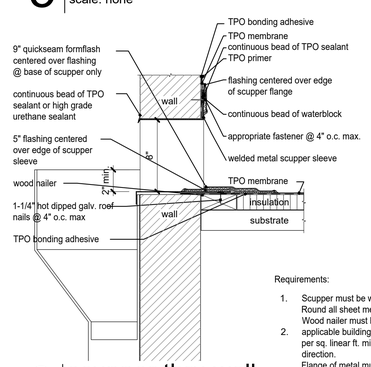
3 roof vent detail
scale: none



4 roof hatch curb detail
scale: none



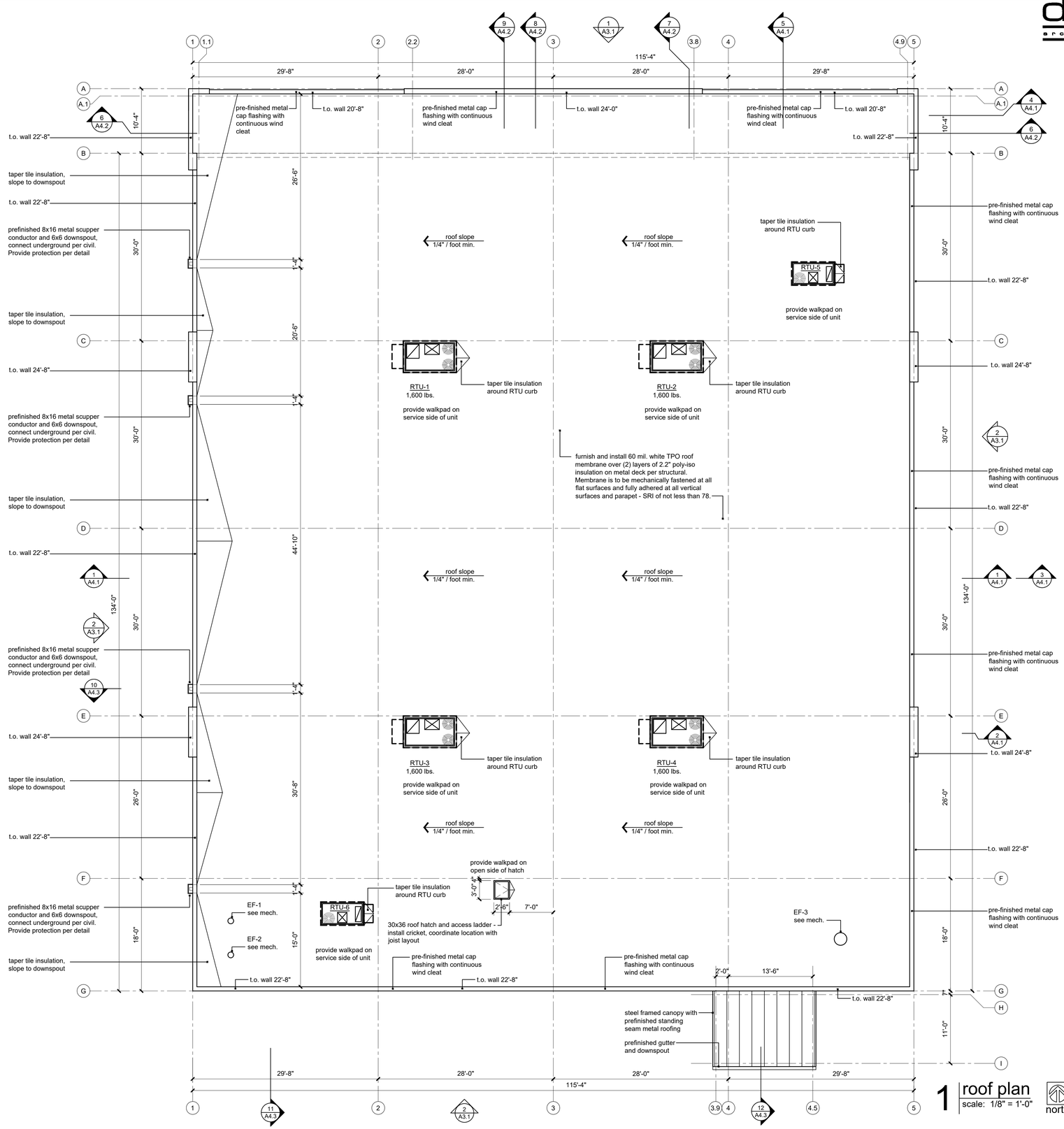
5 roof ladder detail
scale: none



Requirements:

1. Scupper must be welded metal sleeve. Round all sheet metal flange corners. Wood nailer must be installed to meet applicable building codes or 200 lbs. per sq. linear ft. min. at any given direction. Flange of metal must be fully supported by wood and terminated at least 12" from edge of wood.
2.
3.

6 scupper thru wall
scale: none



1 roof plan
scale: 1/8" = 1'-0"

north

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9990
fax: 913.451.9991
www.davidsonae.com

STATE OF MISSOURI
POWELL EMERSON MINNIS
NUMBER A-6398
REGISTERED ARCHITECT

03.20.2023

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.2022
drawn by
DAE
checked by
DAE
revisions

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22185

RELEASED FOR CONSTRUCTION
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Lee's Summit, Missouri
Date 02/24/2023

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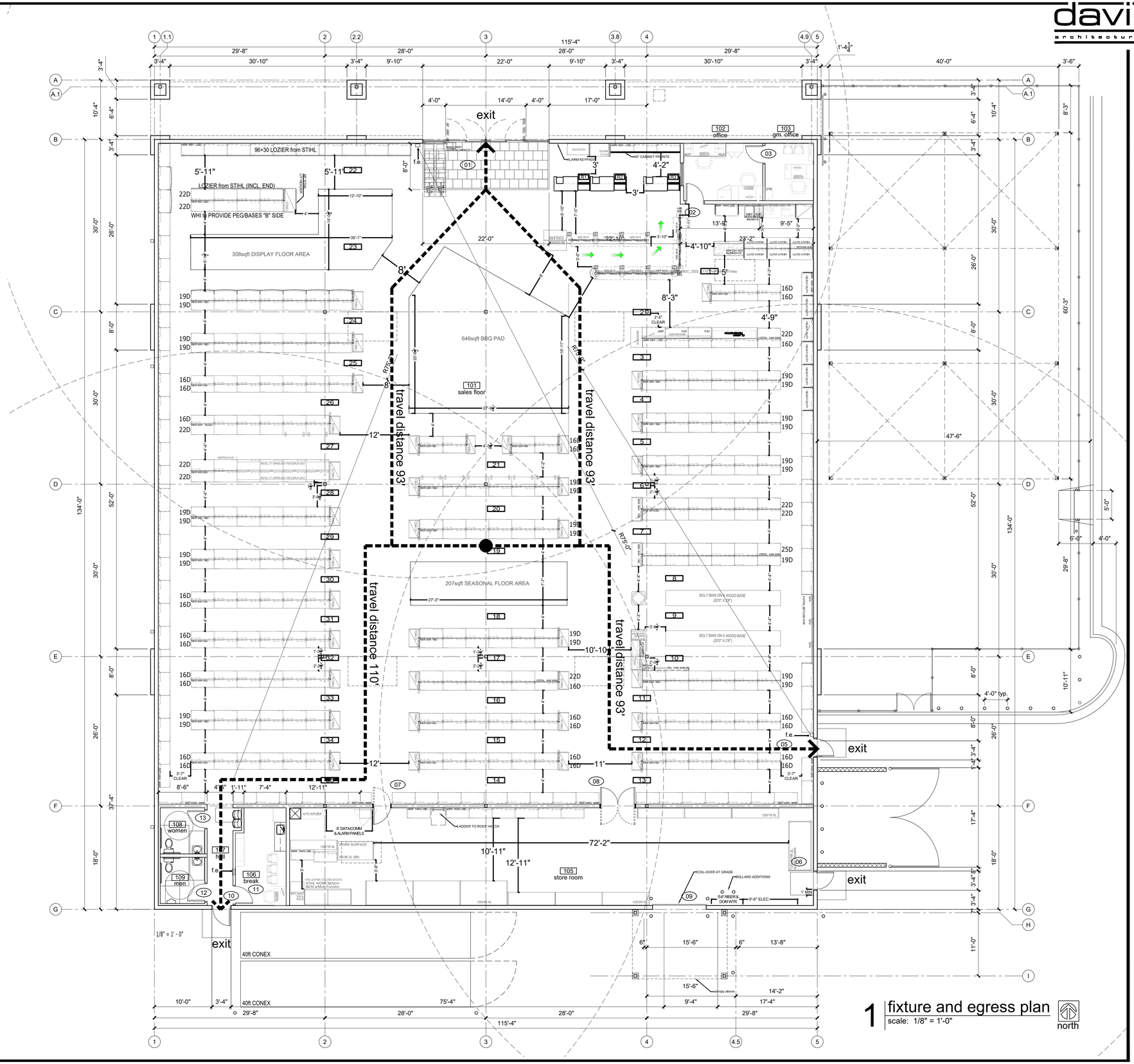
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9990
fax: 913.451.9991
www.davidsonea.com

STATE OF MISSOURI
POWELL EMERSON MINNIS
NUMBER A-6888
REGISTERED ARCHITECT

02.24.2023



1 fixture and egress plan
scale: 1/8" = 1'-0"

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
11.18.2022
drawn by
DAE
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02.24.2023 permit

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Lee's Summit, Missouri
03/20/2023

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4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9990
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STATE OF MISSOURI
POWELL EMERSON MINNIS NUMBER A-6886
REGISTERED ARCHITECT
03.20.2023

exterior materials and finishes:

cmu:
- cmu1 splitface concrete masonry units - Midwest Block and Brick, color limestone
- cmu2 splitface concrete masonry units - Midwest Block and Brick, color slate
- cmu3 splitface concrete masonry units accent - Midwest Block and Brick, color Ivory
- all mortar shall include integral water repellant

cast stone
- cs1 cast stone cap - Midwest Cast Stone, color 1A

storefront:
- anodized aluminum frame, color: clear

glass:
- 1" insulated clear glass with low-E coating and argon fill
- *use SOLARBAN 60 as basis

flashing, scuppers and downspouts:
- f1 prefinished, Firestone, color: charcoal gray

standing seam metal wall panels:
- f2 prefinished, color: Firestone Silver Metallic

corrugated metal wall panels:
- f3 prefinished Firestone UC-601, corrugated panels, color: galvalume finish

metal coiling doors:
- f4 prefinished, color: match pt1

metal soffit panels:
- f5 prefinished Firestone UC-500, vented interlocking soffit panels, color: bone white

caulk:
- color to match adjacent walls

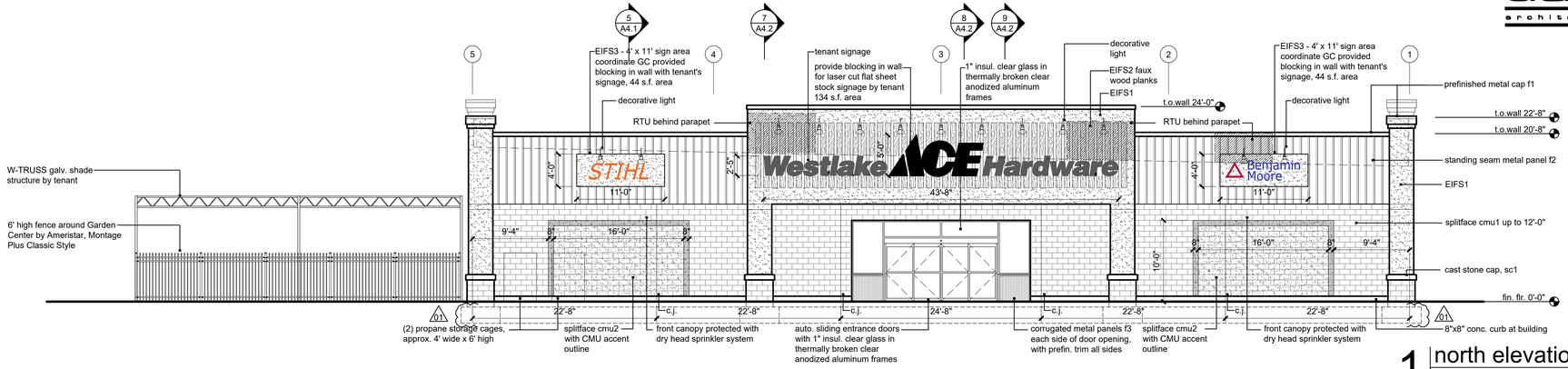
EIFS:
- EIFS1 2" drainable EIFS system, Dryvit fine finish, color: medium gray
- EIFS2 2" drainable EIFS system, faux wood grain planks, fine finish, base color: SW6076 Turkish Coffee, with SW6258 Tricorn Black for wood grain accent. Planks are 7 1/2" wide x 8' long, raised 2", with 3 1/2" spacing between
- EIFS3 2" drainable EIFS system, Dryvit fine finish, color: light gray

exterior hollow metal doors, frames, trash enclosure gates:
- pt1 Pro Industrial High Performance Epoxy, semi-gloss, (1 coat primer, 2 coats paint to cover), color: gray to match building

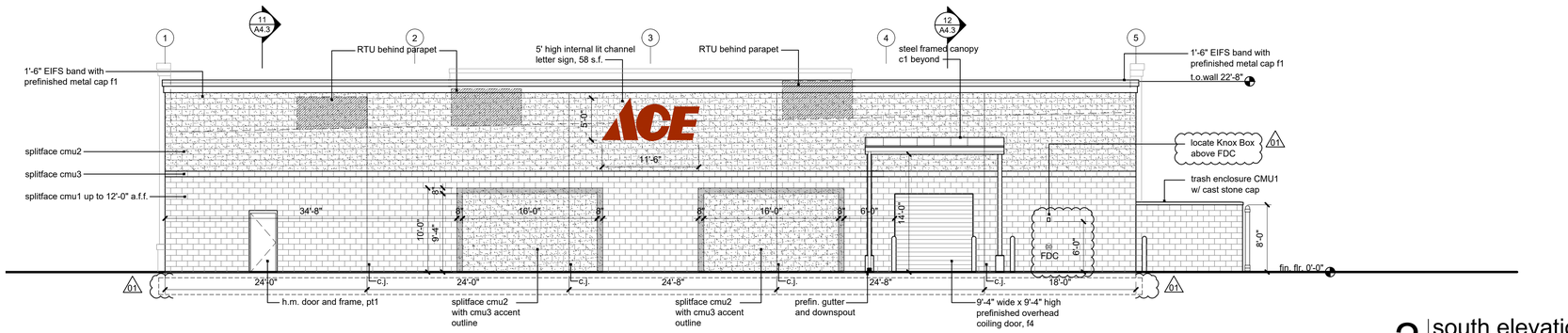
bollards:
- galvanized, with polyethylene covers on all customer facing bollards. Reliance, color: Foundary Gray with red reflective stripes

canopy:
- c1 steel framed canopy with standing seam roofing, paint steel to match building

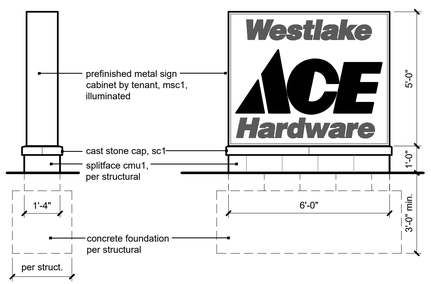
fence:
- 6' high fence by Ameristar, Montage Plus Classic Style, with 2 1/2" sq. vertical posts spaced 8' o.c. typical, set in 36" deep conc. footings per manufacturer's instructions. Intermediate pickets are 3/4" sq. spaced approx. 4" o.c. and horizontal rails are 1 1/2", Black finish.



1 north elevation
scale: 1/8" = 1'-0"



2 south elevation
scale: 1/8" = 1'-0"



5 monument sign elevation
scale: 1/2" = 1'-0"

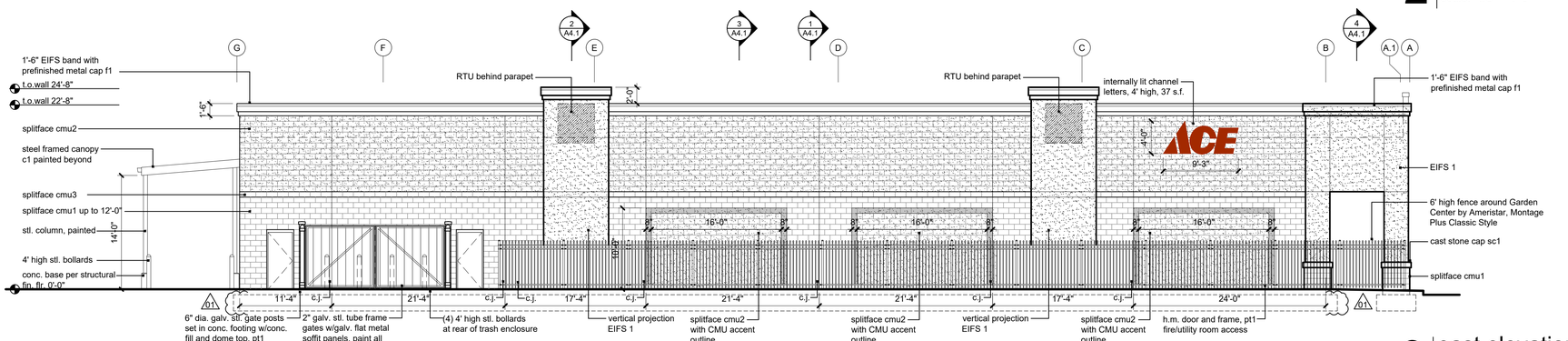
proposed signage:

North elevation (main facade):
- Facade area: 2,527 s.f.
- Total sign area: 222 s.f.
- Sign 1 "Westlake ACE Hardware", surface mounted letters, illuminated by surface mounted lighting, 6' "A" max. height, 134 s.f. area
- Sign 2 "STIHL", surface mounted letters, illuminated by surface mounted lighting, 44 s.f. area
- Sign 3 "Benjamin Moore" surface mounted letters, illuminated by surface mounted lighting, 44 s.f. area

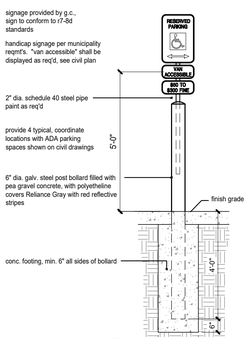
East elevation:
- Facade area: 3,018 s.f.
- Total sign area: 116 s.f.
- Sign 4 "ACE" internally lit, channel letters, 4' high, 37 s.f. area
- Sign 5 "Benjamin Moore" internally lit, channel letters, 2' high, 46 s.f. area
- Sign 6 "Stihl" internally lit, channel letters, 3' high, 33 s.f. area

South elevation:
- Facade area: 2,333 s.f.
- Total sign area: 58 s.f.
- Sign 7 "ACE" internally lit, channel letters, 5' high, 58 s.f.

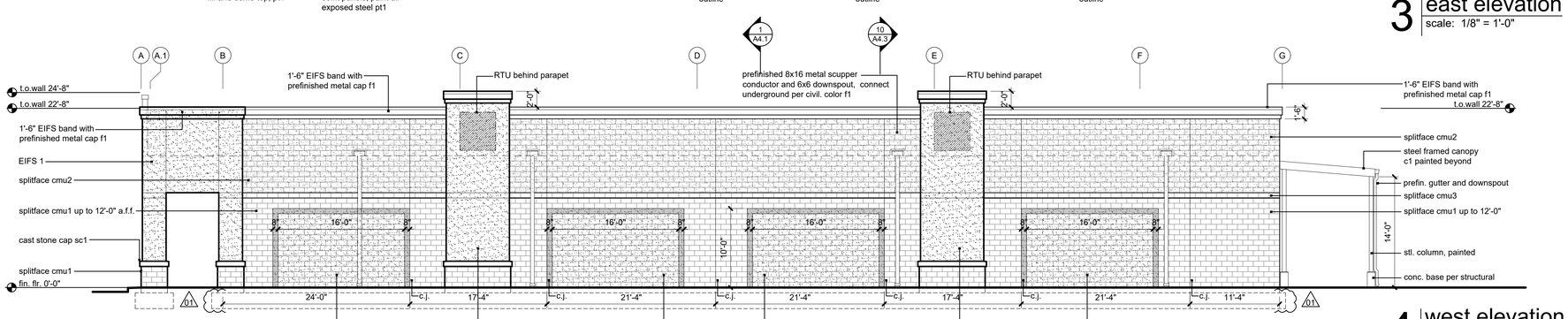
Westlake is asking for signage variance to allow 4 additional building signs. All signage on elevations are below 10% of facade area.



3 east elevation
scale: 1/8" = 1'-0"



6 ADA parking sign/bollard
scale: none



4 west elevation
scale: 1/8" = 1'-0"

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www.davidsonea.com

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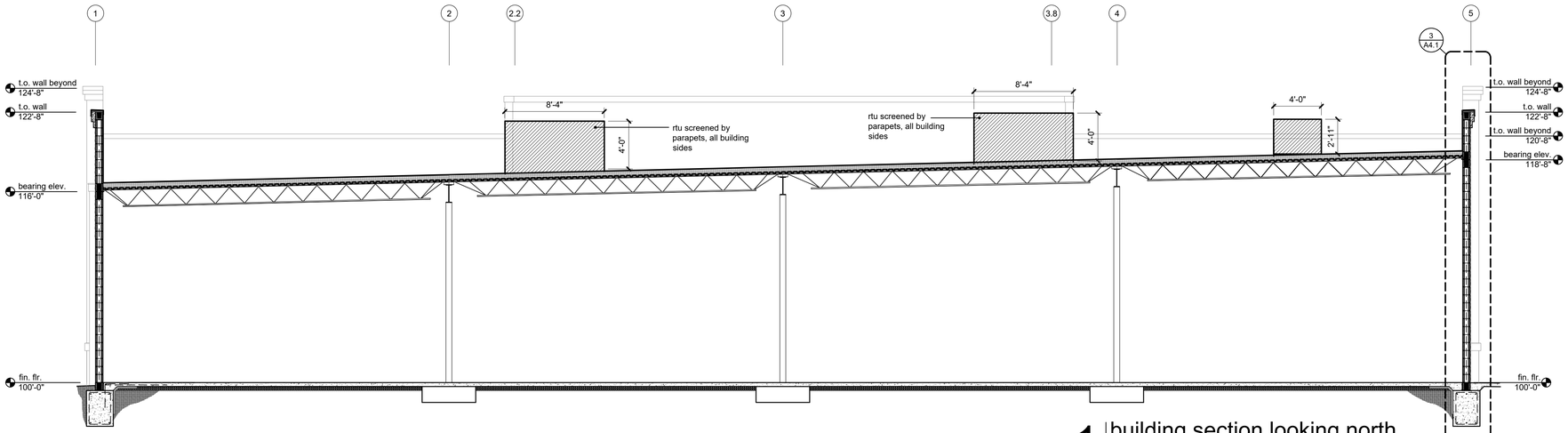
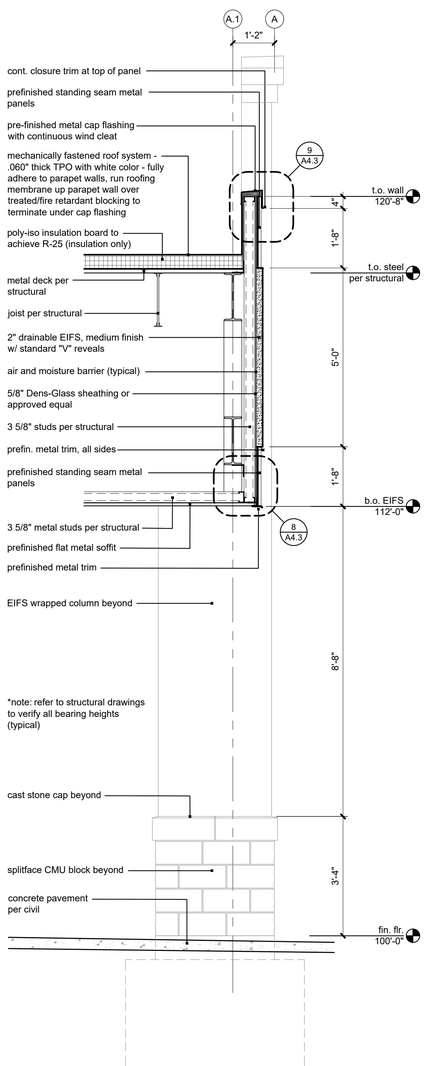
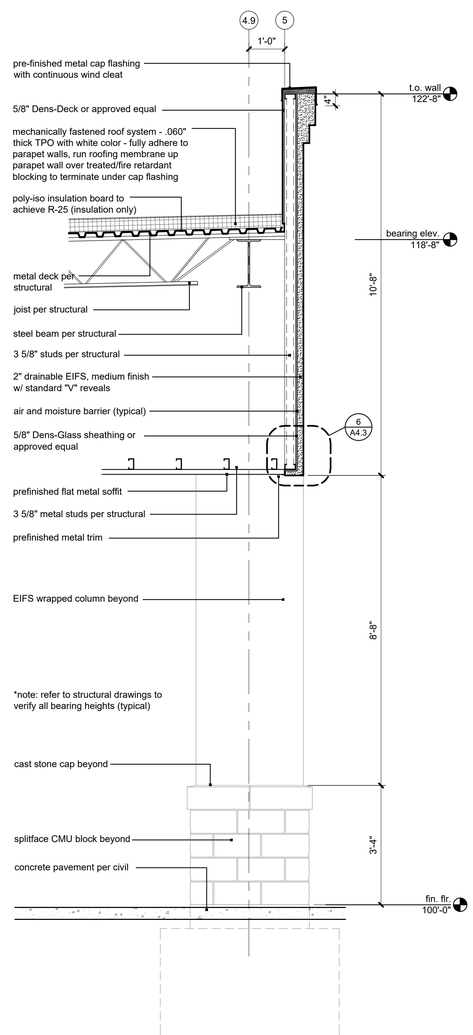


1 building section looking north
scale: 3/16" = 1'-0"



5 wall section
scale: 1/2" = 1'-0"



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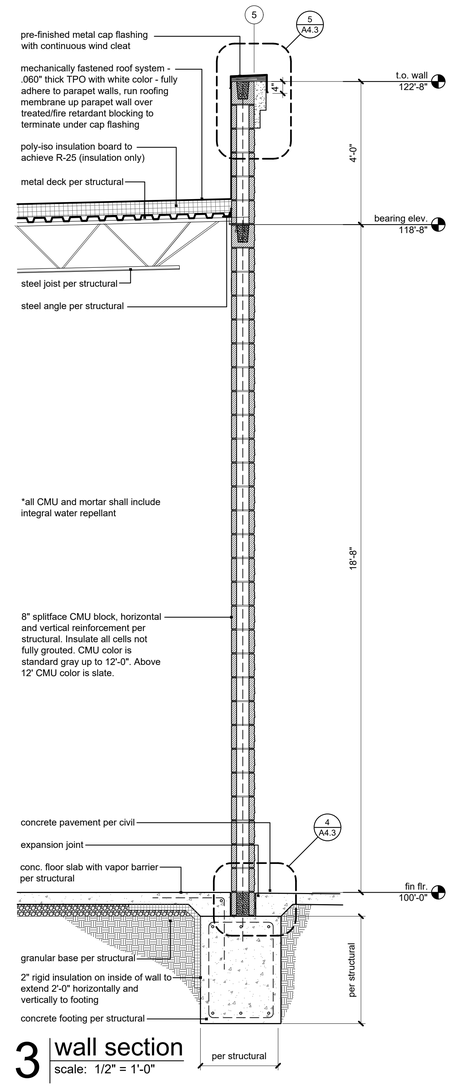

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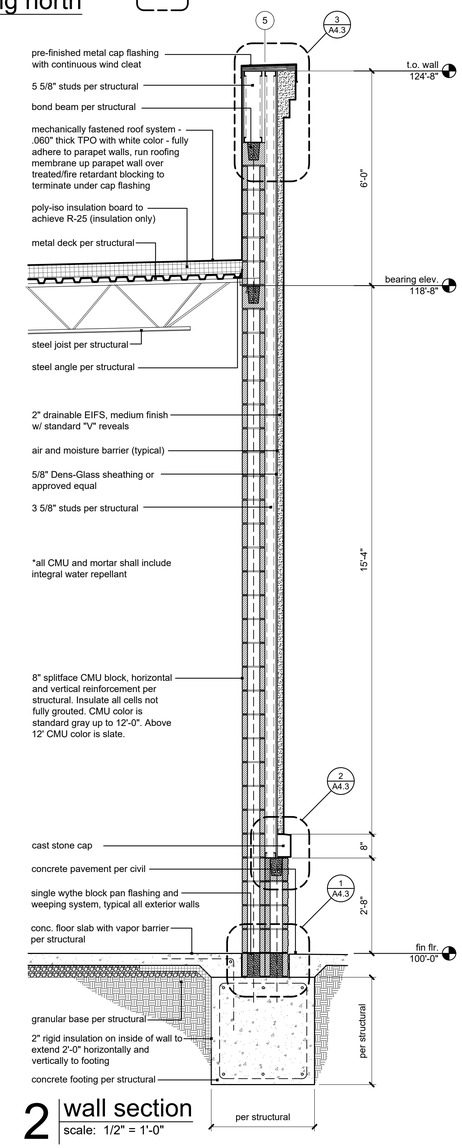

2 wall section
scale: 1/2" = 1'-0"

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.2022
drawn by
DAE
checked by
DAE
revisions

09.12.2022	PDP permit
02.24.2023	

sheet number
A4.1

drawing type
permit
project number
22185

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Lee's Summit, Missouri
Date: 02/24/2023

davidson
architecture&engineering
4301 Indian Creek Parkway
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fax: 913.451.9991
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STATE OF MISSOURI
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NUMBER A-6666
REGISTERED ARCHITECT

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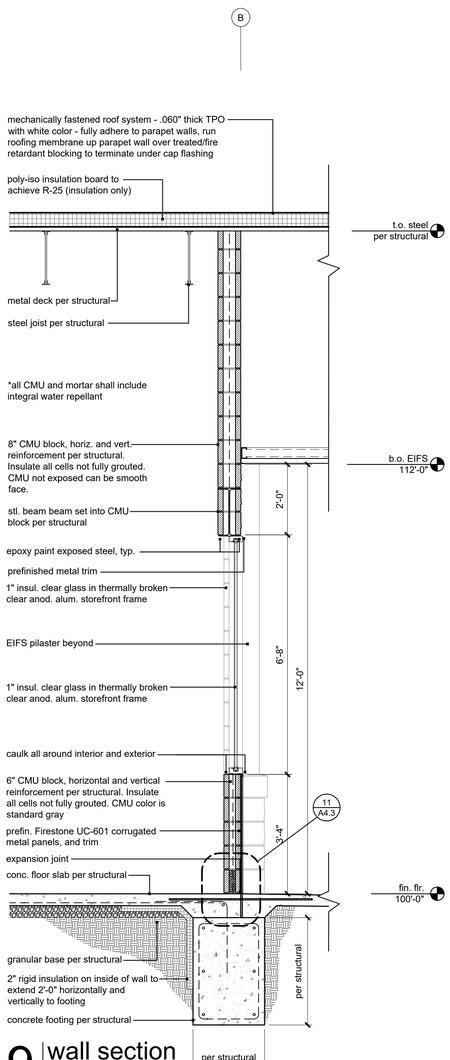

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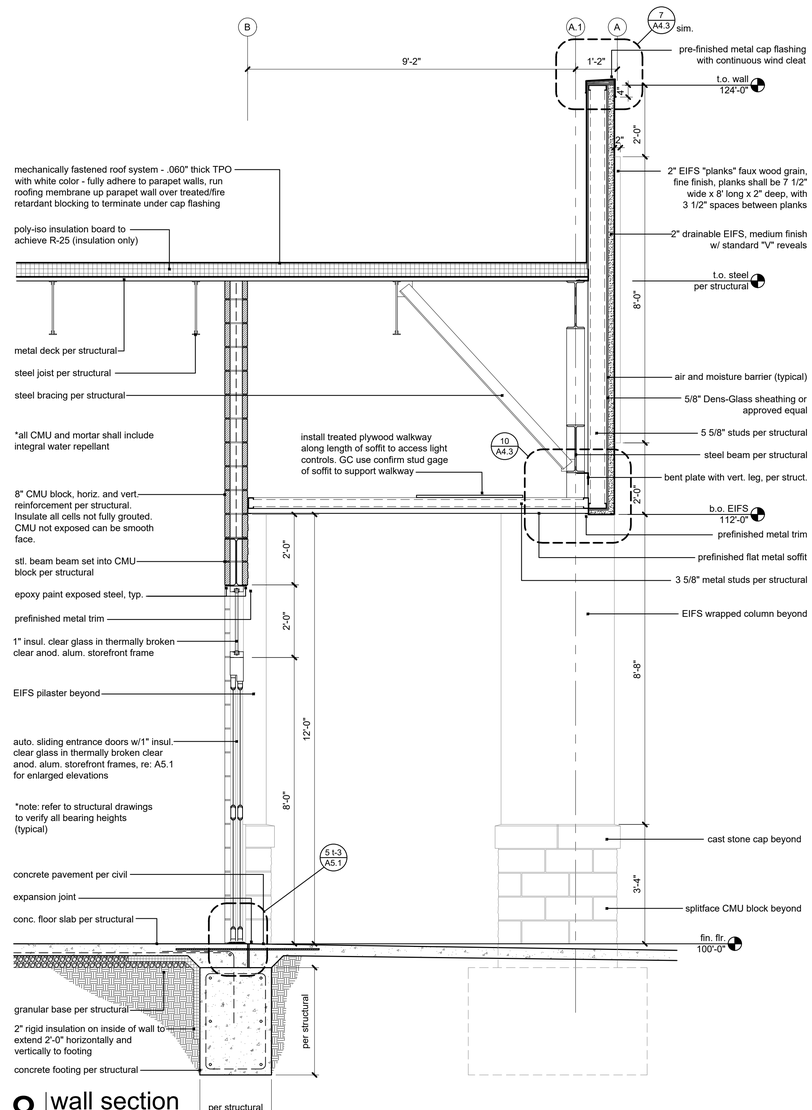
scale: 1/2" = 1'-0"



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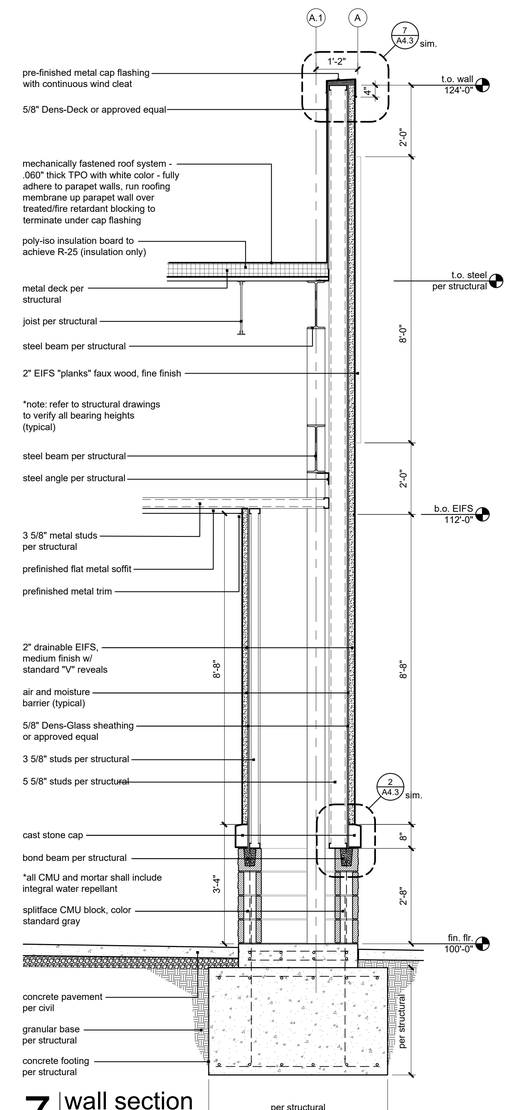
scale: 1/2" = 1'-0"



7 wall section
scale: 1/2" = 1'-0"

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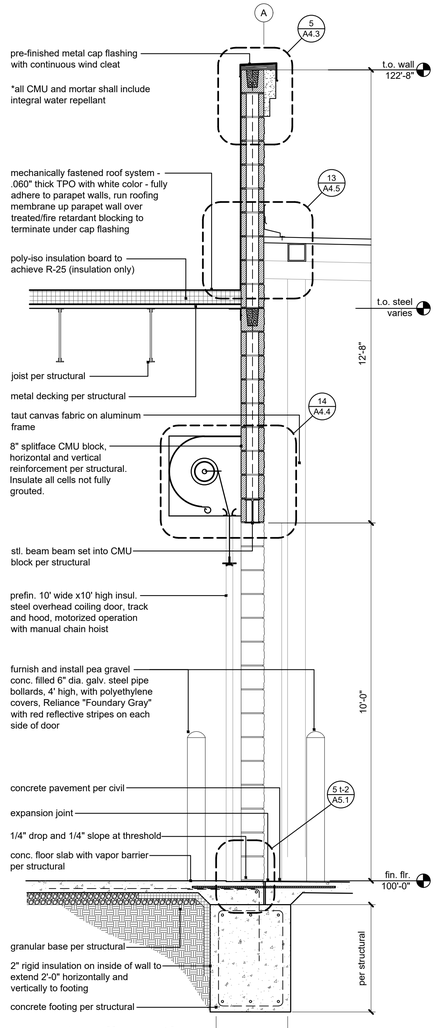

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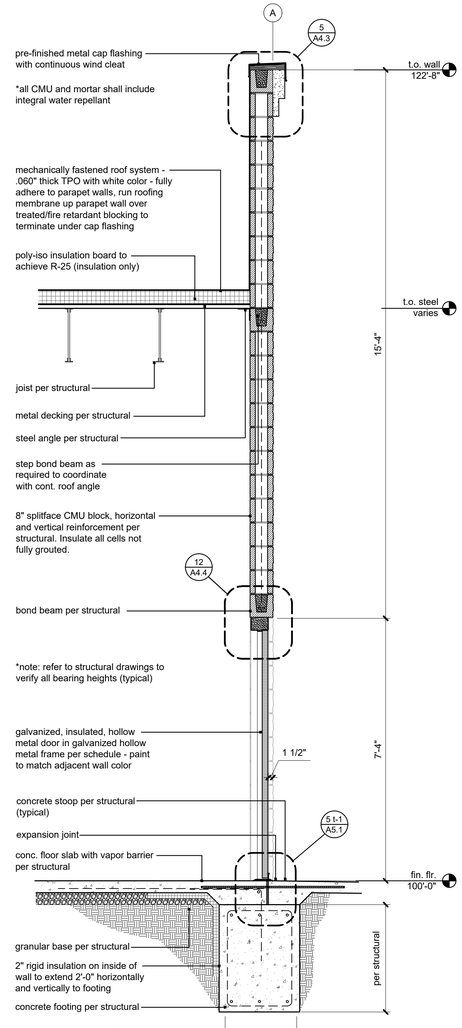
scale: 1/2" = 1'-0"



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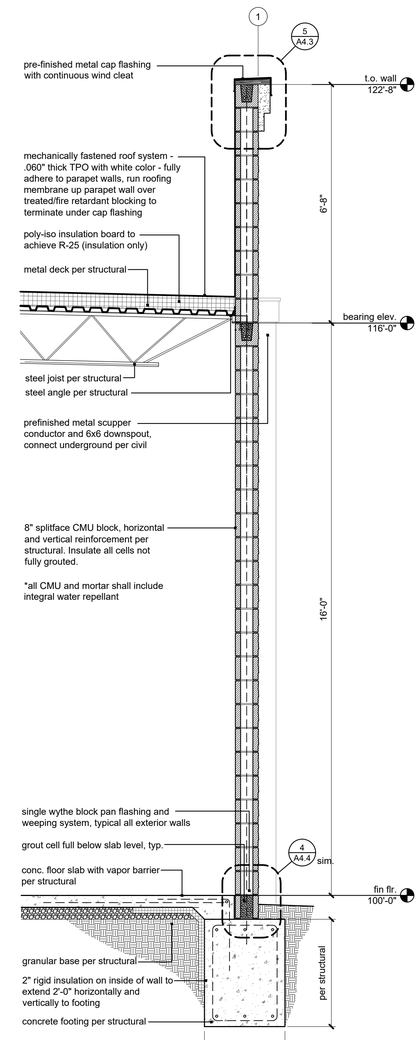

10 wall section
scale: 1/2" = 1'-0"

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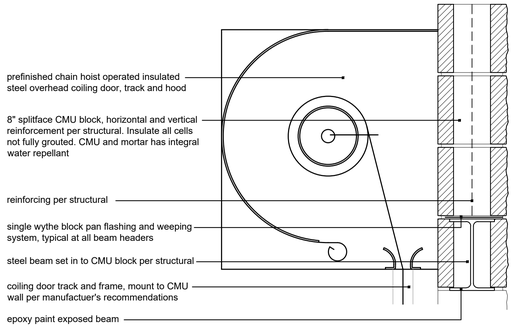

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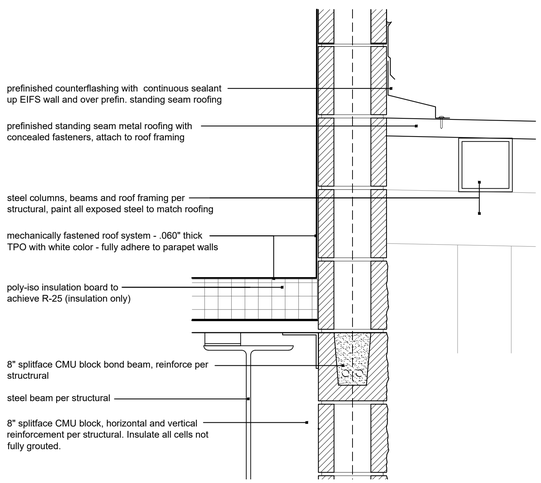
scale: 1/2" = 1'-0"



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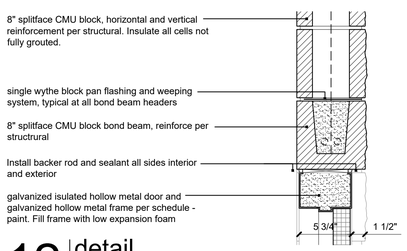
scale: 1/2" = 1'-0"



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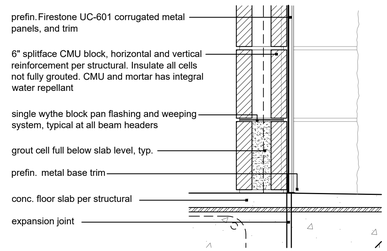
scale: 1/2" = 1'-0"



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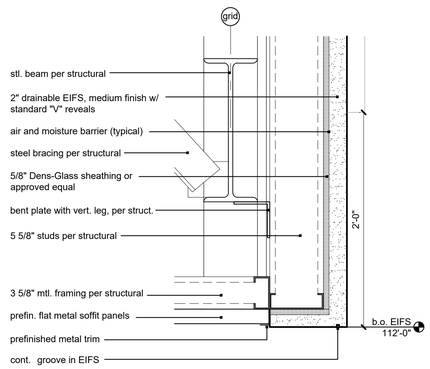
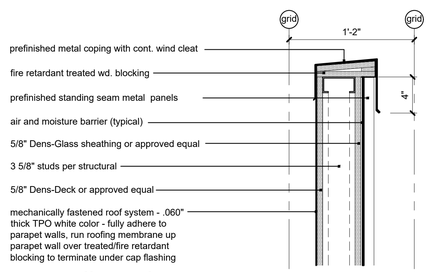
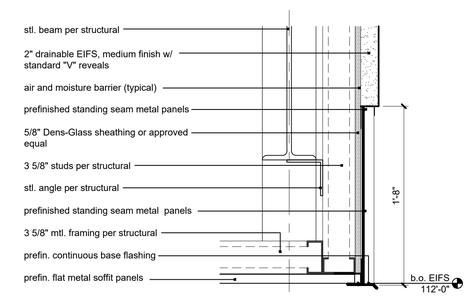
scale: 1/2" = 1'-0"



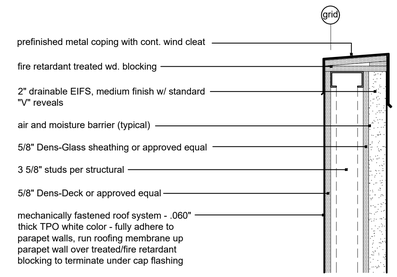
10 detail
scale: 1/2" = 1'-0"



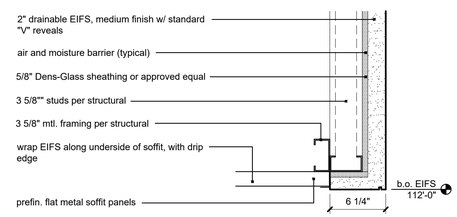
9 wall section
detail



8 detail
scale: 1/2" = 1'-0"



7 detail
scale: 1/2" = 1'-0"



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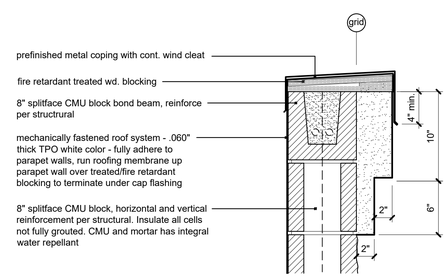
scale: 1/2" = 1'-0"



5 detail
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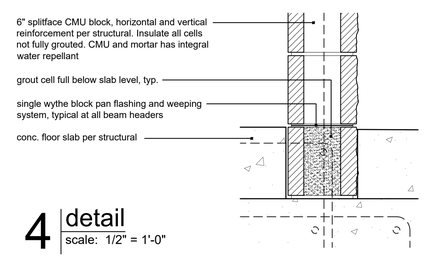

4 detail
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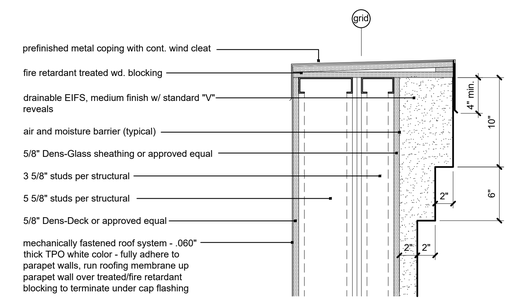
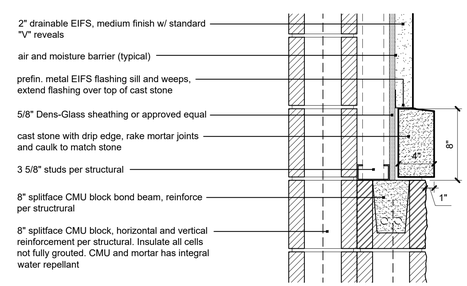
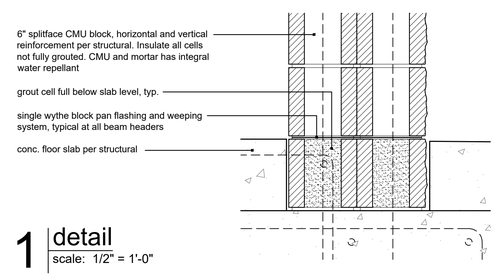


3 detail
scale: 1/2" = 1'-0"



2 detail
scale: 1/2" = 1'-0"



1 detail
scale: 1/2" = 1'-0"

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

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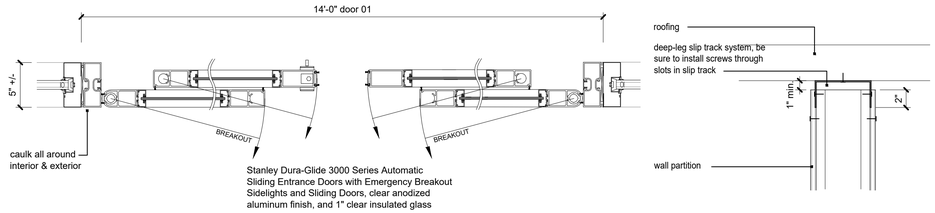
Development Services Department
Lee's Summit, Missouri
03/02/2023

door schedule

door #	doors type	doors mat.	doors fin.	doors size width	doors size height	doors size thick	frames type	frames mat.	frames fin.	frames details jamb	frames details sill	fire rating	hdw. group	remarks
01	d	alum./gl.	clr.anod.	14'-0" unit	8'-0" unit	-	-	alum.	clr. anod.	4/A5.1	t-3	0	1	Provide micro-switch alarm option for wiring into burlge alarm system.
02	b	s.c. wood	stain/finish	3'-0"	7'-0"	1 3/4"	1	galv. mtl.	paint		-	0	7	
03	b	s.c. wood	stain/finish	3'-0"	7'-0"	1 3/4"	2	galv. mtl.	paint		-	0	6	provide closer with hold open feature
04	deleted													
05	a	galv. insul.	paint	3'-0"	7'-0"	1 3/4"	1	galv. mtl.	paint		t-1	0	3	
06	a	galv. insul.	paint	3'-0"	7'-0"	1 3/4"	1	galv. mtl.	paint		t-1	0	3	
07	e	alum.	prefin.	3'-0"	8'-0"	-	3	galv. mtl.	paint		-	0	1	
08	e	alum.	prefin.	pr. 3'-0"	8'-0"	-	3	galv. mtl.	paint		-	0	1	
09	f	galv. insul.	prefin.	9'-4"	9'-4"	1 3/4"	-	-	-		t-2	0	-	provide side locks
10	a	galv. insul.	paint	3'-0"	7'-0"	1 3/4"	1	galv. mtl.	paint		t-1	0	3	
11	c	s.c. wood	stain/finish	3'-0"	7'-0"	1 3/4"	1	galv. mtl.	paint		-	0	6	
12	b	s.c. wood	stain/finish	3'-0"	7'-0"	1 3/4"	1	galv. mtl.	paint		-	0	4	provide closer with hold open feature
13	b	s.c. wood	stain/finish	3'-0"	7'-0"	1 3/4"	1	galv. mtl.	paint		-	0	4	provide closer with hold open feature

door & hardware notes:

- Re: sheet A5.2 for hardware schedule.
- Door frames shall be 16 ga. with mittered and welded corners.
- All hollow metal doors shall be 16 ga. min.
- All hinges at exterior doors shall have non-removable pins.
- Doors with closer's shall have ball bearing hinges.
- Thresholds shall coordinate with adjacent floor finish at either side.
- Hardware shall be heavy-duty, commercial grade, level 1 with lever handle.
- Hardware shall be manufactured by Schlage or approved equal.
- Finish hardware shall meet article III of the A.D.A.
- Keying shall be coordinated with owner prior to order of hardware.
- All hardware sets shall be fitted with Schlage "C" keyway compatible cylinders - 6 pin - "0" bit. and shall have interchangeable cores.
- All hollow metal door and window frames shall be caulked around entire perimeter and at the inside corners.
- All exterior hollow metal doors and frames shall be galvanized and low expansion foam insulated.
- Wood doors shall be solid core wood, plain sliced birch "select" and "clear". Stain and finish per finish schedule.

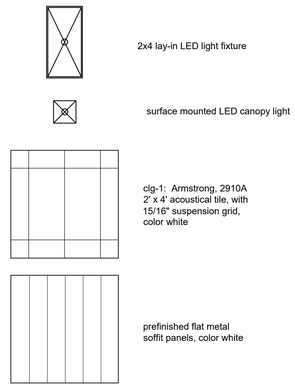


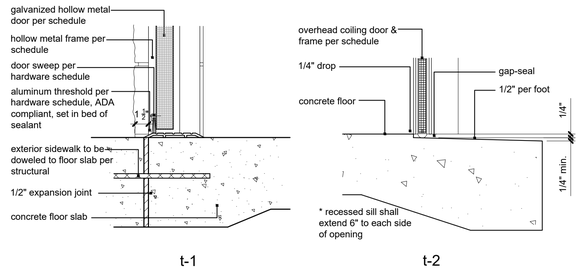
Stanley Dura-Glide 3000 Series Automatic Sliding Entrance Doors with Emergency Breakout Sidelights and Sliding Doors, clear anodized aluminum finish, and 1" clear insulated glass

4 detail at sliding entrance doors
scale: 1 1/2" = 1'-0"

3 slip track detail
scale: 1 1/2" = 1'-0"

reflected ceiling legend:



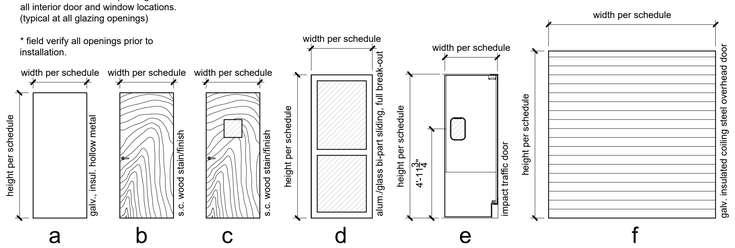


t-1 t-2 t-3

5 threshold types
scale: 1 1/2" = 1'-0"

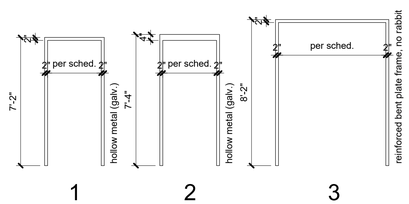
* furnish and install tempered glass at all interior door and window locations. (typical at all glazing openings)

* field verify all openings prior to installation.

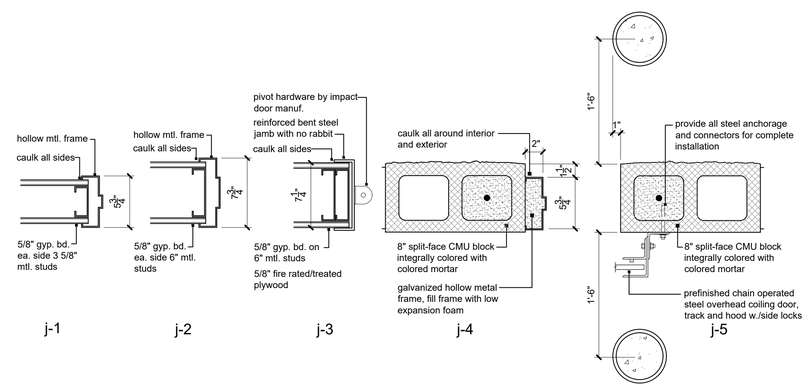


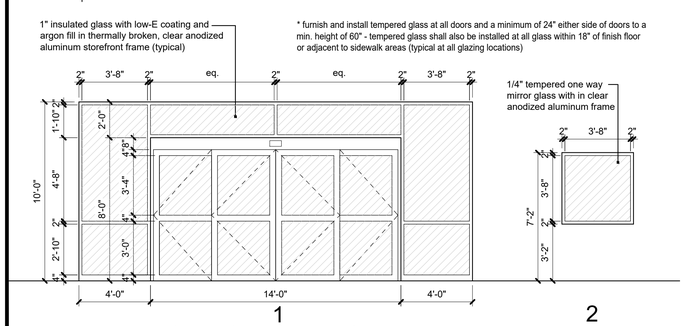
Eliason LWP-3, 0.063" clear anod. alum. traffic door with 9"x14" clear acrylic window set in black rubber molding, 30" stainless steel base plates and 9" jamb guards, both sides of door

9 door types
scale: 1/4" = 1'-0"



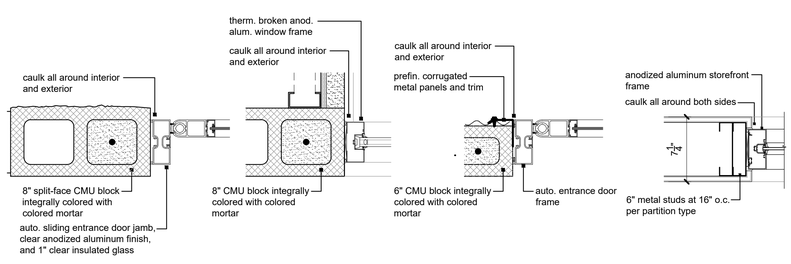
8 frame types
scale: 1/4" = 1'-0"



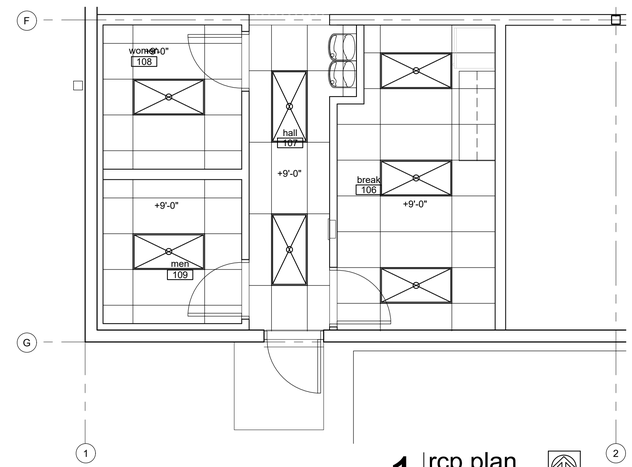


Stanley Dura-Glide 3000 Series Automatic Sliding Entrance Doors with Emergency Breakout Sidelights and Sliding Doors, clear anodized aluminum finish, and 1" clear insulated glass

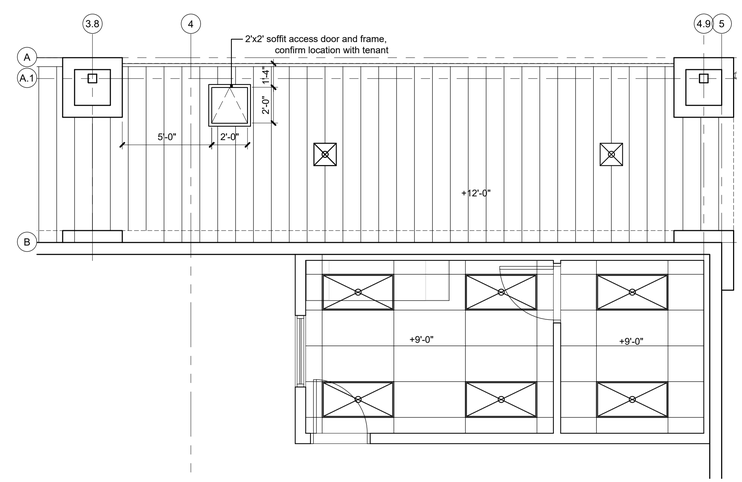
7 aluminum frame door/window types
scale: 1/4" = 1'-0"



6 jamb types
scale: 1 1/2" = 1'-0"



1 rcp plan
scale: 1/4" = 1'-0"
north



2 rcp plan
scale: 1/4" = 1'-0"
north

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
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STATE OF MISSOURI
POWELL EMERSON MINNIS
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Hardware

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Development Services Department
Lee's Summit, Missouri
Date 2/24/2023

room finish schedule

room no.	room name	floor: sc-1	sc-2	ct-1	cpt-1	base: b-1	ct-1	none	wall: north	south	east	west	ceiling: clg-1	open				clg. ht.	remarks
101	sales floor	●				●			pt-3	pt-4	pt-4	pt-2		●				varies	install wall base on exposed drywall exposed partitions and on and on perimeter shelving after shelving has been installed paint all steel columns in sales area semi-gloss "Stonington Gray"
102	office				●	●			pt-1	pt-1	pt-1	pt-1	●					9'-0"	
103	manager's office				●	●			pt-1	pt-1	pt-1	pt-1	●					9'-0"	
104	deleted																		
105	store room		●			●			pt-1	pt-1	pt-1	pt-1		●				varies	no paint on plywood wall surfaces, no wall base on CMU
106	break	●				●			pt-1	pt-1	pt-1	pt-1	●					9'-0"	
107	hall	●				●			pt-1	pt-1	pt-1	pt-1	●					9'-0"	
108	women			●			●		pt-1/ct-1	pt-1/ct-1	pt-1/ct-1	pt-1/ct-1	●					9'-0"	install ceramic tile to 42" above floor, paint wall above
109	men			●			●		pt-1/ct-1	pt-1/ct-1	pt-1/ct-1	pt-1/ct-1	●					9'-0"	install ceramic tile to 42" above floor, paint wall above

finish legend

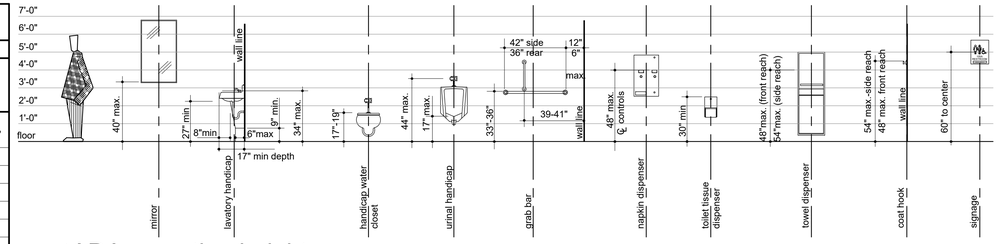
sc-1	sealed, hardened, stained diamond polished concrete finish - refer to specification section 033543 Polished Concrete Finishing. Concrete floors to be free of bumps, pits, scrapes, etc.
sc-2	sealed concrete with clear Ashford sealer 2 coats - concrete floors to be free of bumps, pits, scrapes, etc.
cpt-1	carpet tile, Shaw, Change in Attitude TL, Style J0111, Take Action", color: 12516, 26 oz.
b-1	standard 4" rubber base, Roppe or Johnsonite, color: black, roll stock, on exposed drywall partitions, base not required behind racks.
pt-1	wall paint, Benjamin Moore, latex, color: Revere Pewter HC-172 (1 coat primer, 2 coats paint - to cover) - level 4 finish - satin finish for gypsum board walls
pt-2	wall paint, Benjamin Moore, latex, color: Vienna Green 538 (1 coat primer, 2 coats paint - to cover) - level 4 finish - satin finish for gypsum board walls
pt-3	wall paint, Benjamin Moore, color: Stonington Gray HC-170 (1 coat primer, 2 coats paint - to cover) - level 4 finish - latex satin finish for gypsum board walls, alkyd enamel for interior columns
pt-4	wall paint, Benjamin Moore, latex, color: Schooner AF-520 (1 coat primer, 2 coats paint - to cover) - level 4 finish - satin finish for gypsum board walls
pt-5	not used
pt-6	metal door frames, paint, Benjamin Moore, alkyd enamel, semi-gloss, color: Black 2132-10 (1 coat primer, 2 coats paint - to cover)
pt-7	exterior metal, Pro Industrial High Performance Epoxy, semi-gloss, (1 coat primer, 2 coats paint - to cover), color TBD
dfpt-1	not required as long as steel, joists and decking comes primed gray
	note: coordinate all paint colors with owner
pl-1	plastic laminate cabinets: Wilsonart, color: D427-60 Linen
pl-2	plastic laminate countertop: Wilsonart, color 4623 Graphite Nebula
ct-1	ceramic tile, The Tile Shop, Fired Earth Ceramics, 6x24 wood look porcelain tile, color Dyrewood Sage. Grout to match concrete finish. Install tile up to 42" a.f.f.
clg-1	acoustical ceiling tile, Armstrong 2910A, size: 24" x 48" panel with 15/16" exposed tee suspension grid system, color: white
frp	fiber reinforced plastic, Marlite, pebbled texture, color: gray
dr	solid core birch wood doors, plain sliced "select" and "clear", Stain Minwax color Classic Gray, with Minwax Polycrylic satin finish.
entry mat	Mats Inc., Diagonal Tile, color: gray, installed quarter turn with Release Bond adhesive. Install 2-3/4" aluminum transition edge to surrounding floor surfaces.

finish notes

1. All structural steel beams, columns and joists shall be primed gray.
2. Temper all interior glass.
3. Each material specified for application on the entire project shall be from the same dye lot.
4. All surfaces shall be cleaned and conditioned to receive new finish as required by finish product manufacturer. Surfaces shall be smooth, free from depressions, protrusions, pits, slumps, streaks, flashing, and variation in texture. Installer/subcontractor shall notify general contractor prior to installation if conditions are not satisfactory.
5. All wall mounted mechanical slots or grilles to be painted to match the wall on which they occur. Do not paint prefinished wall mullion end caps.
6. Contractor shall be responsible for leveling of floor slabs to receive specified finishes.
7. All patterned flooring to be centered in both directions and generated from center of room outward toward partitions, unless otherwise noted.
8. All floor finish changes to occur under centerline of door in closed position.
9. Combustible interior finish products shall be provided per the requirement of the International Building Code section 803.4.
10. Finishes shall be bid as specified or as approved equal only.
11. Utilize dens-armour plus in all plumbing wet walls, walls anticipated to be in contact with moisture, and walls to receive ceramic tile.
12. Refer to finish legend for level of gypsum board finish as defined by the gypsum association.

door hardware schedule

set no.	item	description	finish	remarks
1	Hardware by manufacturer (including breakaway hardware at sliding doors).			Door 01 shall have the following sign at adjacent location: "This door to remain unlocked when the building is occupied." Letters to be 1" minimum in height. Provide micro-switch alarm option for wiring into burlge alarm system.
2	not used			
3	1-1/2 pair hw hinges	5bb1 hw 4.5 x 4.5 nrp - ive	652	provide button and buzzer per electrical at door #10 only
	1 panic hardware	33a-nl-op-von-cx-alk	626	provide delay opening and alarm
	1 drip cap	16a - ngp	aluminum	
	1 surface closer	4110 cush - lcn	689	provide hold open feature
	1 set seal	700na - ngp	-	
	1 door sweep	101na - ngp	aluminum	
	1 threshold	425 - ngp	aluminum	
	1 kickplate	8400 10" - ives	630	
	1 peep hole viewer	u698 - ives	626	mount 60" from floor, door 06 only
4	1 1/2 pair hw hinges	5bbl - 4x4 - ives	652	
	1 closer	1461 cush - lcn	689	provide hold open feature
	1 privacy lockset	nd40s rho - schlage	626	
	1 wall stop	ws407ccv - ives	630	
	3 silencers	sr64 - ives	9'y	
	1 kickplate	8400 10" - ives	630	
5	1 1/2 pair hw hinges	5bbl - 4x4 - ives	652	
	1 storeroom lockset	nd80ld rho - schlage with dummy	626	
	3 silencers	sr64 - ives	9'y	
6	1 1/2 pair hw hinges	5bbl - 4x4 - ives	652	
	1 office lockset	nd50ld rho - schlage	626	provide a closer with hold open feature for door 03
	3 silencers	sr64 - ives	9'y	
	1 wall stop	ws407ccv - ives	630	
	1 kickplate	8400 10" - ives	630	
7	1 1/2 pair hw hinges	5bbl - 4x4 - ives	652	
	1 storeroom lockset	nd80ld rho - schlage with dummy	626	
	1 closer	1461 cush - lcn	689	
	3 silencers	sr64 - ives	9'y	
	1 kickplate	8400 10" - ives	630	
	1 wall stop	ws407ccv - ives	630	
	1 peep hole viewer	u698 - ives wide angle viewer	626	mount 60" from floor

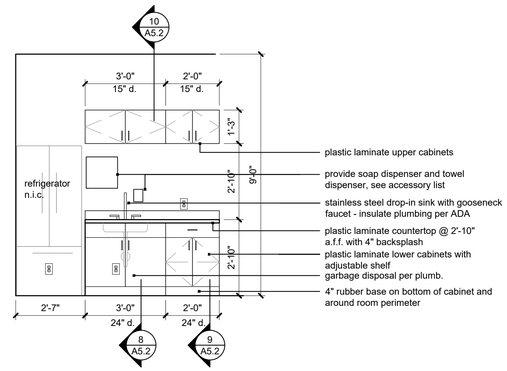


1 ADA mounting heights
1/4" = 1'-0"

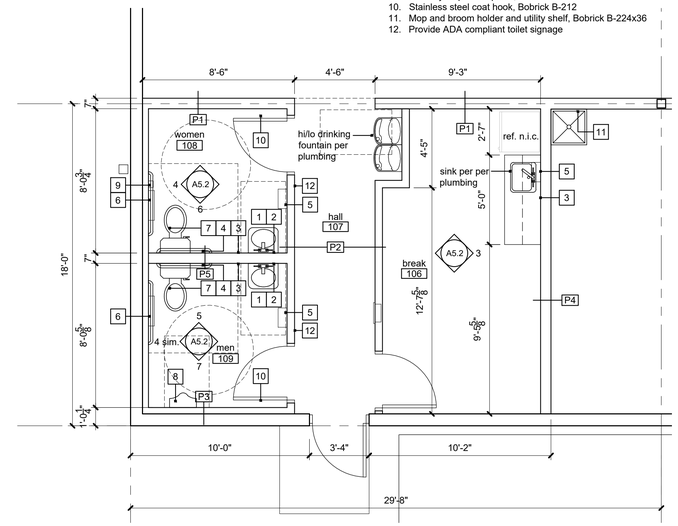
restroom accessory list:

**all restroom accessories to be mounted per ADA
**provide wd. blocking in walls as required to secure accessories

1. Wall mounted sink at 2'-10" a.f.f. with lavatory guard and wrist blade faucet per ADA.
2. Wall mounted rimless mirror - 24" x 48" with bottom at 40" a.f.f. max. per ADA, Bobrick B-165
3. Surface mounted soap dispenser, Bobrick B-42
4. 18" A.D.A. vert. grab bar - stainless steel, Bobrick B-5806 36" A.D.A. horiz. grab bar - stainless steel, Bobrick B-5806 42" A.D.A. horiz. grab bar - stainless steel, Bobrick B-5806
5. Surface mounted paper towel dispenser, Kimberly-Clark Lev-R-Matic 6119036
6. Surface mounted toilet paper dispenser, Harbor, Twin Jumbo Tissue Dispenser HDJRT1
7. ADA height toilet (white)
8. ADA height urinal (white)
9. Sanitary Napkin Disposal, Brobrick B-270
10. Stainless steel coat hook, Bobrick B-212
11. Mop and broom holder and utility shelf, Bobrick B-224x36
12. Provide ADA compliant toilet signage

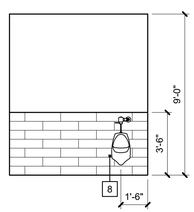


3 break elevation
scale: 3/8" = 1'-0"

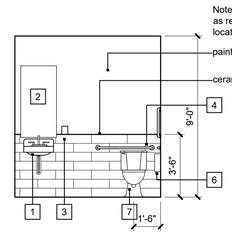


2 enlarged plan
scale: 1/4" = 1'-0"

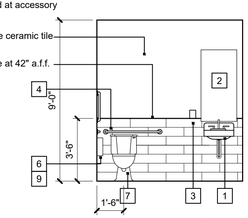
north



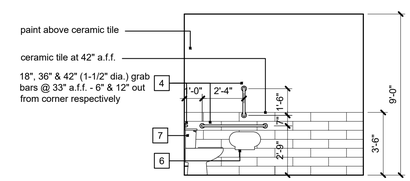
7 men's r.r. elev.
scale: 1/4" = 1'-0"



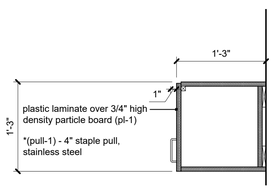
6 women's r.r. elev.
scale: 1/4" = 1'-0"



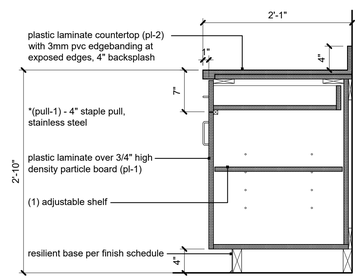
5 men's r.r. elev.
scale: 1/4" = 1'-0"



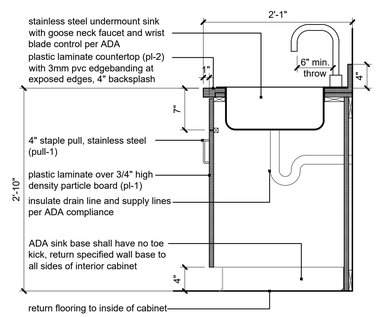
4 restroom side elevation
scale: 1/4" = 1'-0"



10 upper (half) cab. detail
scale: 1"=1'-0"



9 base cabinet detail
scale: 1"=1'-0"



8 sink base detail
scale: 1"=1'-0"

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9990
fax: 913.451.9991
www.davidsonea.com

STATE OF MISSOURI
POWELL EMERSON MINNIS
NUMBER A-6886
REGISTERED ARCHITECT

02.24.2023

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.2022
drawn by
DAE
checked by
DAE
revisions
09.12.2022 △ PDP
02.24.2023 permit

sheet number
A5.2

drawing type
permit
project number
22185

RELEASED FOR CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
03/30/2023

Governing Building Code: 2018 IBC

Design Specifications:
- ASCE 7-16
- ACI 318-14
- ASCE 360-16
- AISC 360-16
- AISC 341-16
- AISI S240-15
- ANSI/AWC NDS - 2018
- TMS 402-16

Design Loads:

Roof Loads:
- Dead Load: 15 psf
- Live Load: 20 psf

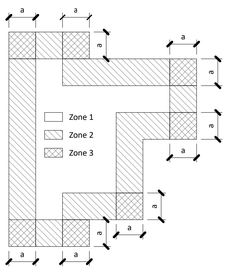
Wind Loads:
- Occupancy Category: II
- Velocity: 109 mph
- Exposure: C
- Iw: 1.0

Snow Loads:
- Pg: 20 psf
- Pf: 14 psf
- Ce: 1.0
- Is: 1.0
- Ct: 1.0
- Drift Load: Per Plan

Seismic Loads:
- Ie: 1.0
- Ss: 0.100 g
- S1: 0.068 g
- Site Class: D (Assumed)
- Sds: 0.106 g
- Sd1: 0.109 g
- Seismic Design Category: B
- Seismic Force- Resisting System: Ordinary Reinforce Masonry Shear Wall
- Design Base Shear: 38 kips
- Cs: 0.0533
- R: 2
- Analysis Procedure Used: E.L.F.P.

Design Loading Notes:

1. Dead load shown includes collateral load of 3 psf.
2. See components and cladding table for design wind pressures.
3. See net uplift diagram for roof framing due to wind pressures.



COMPONENTS & CLADDING WIND PRESSURES

Zone	Effective Wind Area (sq ft)	Max. +VE Pressure (psf)	Max. -VE Pressure (psf)
1 - Roof Interior	10	10.8	-42.5
1 - Roof Interior	20	10.2	-39.6
1 - Roof Interior	50	9.3	-35.9
1 - Roof Interior	≥ 100	8.6	-33.1
2 - Roof Edge	10	24.4	-56.0
2 - Roof Edge	20	23.3	-52.4
2 - Roof Edge	50	21.9	-47.6
2 - Roof Edge	≥ 100	20.8	-44.0
3 - Roof Corner	10	24.4	-56.0
3 - Roof Corner	20	23.3	-52.4
3 - Roof Corner	50	21.9	-47.6
3 - Roof Corner	≥ 100	20.8	-44.0
4 - Wall Interior	10	24.4	-26.4
4 - Wall Interior	20	23.3	-25.3
4 - Wall Interior	50	21.9	-23.9
4 - Wall Interior	≥ 100	20.8	-22.8
4 - Wall Interior	≥ 500	18.3	-20.3
5 - Wall Edge	10	24.4	-32.5
5 - Wall Edge	20	23.3	-30.4
5 - Wall Edge	50	21.9	-27.5
5 - Wall Edge	≥ 100	20.8	-25.3
5 - Wall Edge	≥ 500	18.3	-20.3

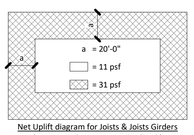
Components & Cladding Wind Zone Diagram

1. The components & cladding (C&C) wind pressures shown assume a mean roof height of 17'-4" above finished floor elevation. All components shall be designed to resist the provided pressures, which shall be clearly defined on all shop drawings. Refer to wind zone diagram for zone locations. Plus and minus signs signify pressures acting toward and away from surfaces, respectively.

2. The components & cladding wind zone diagram is generalized to show all possible conditions. The diagram shape may not match the specific layout for this project.

3. a = 7'-0"

4. Internal Pressure Coefficient = ±0.18



Net Uplift diagram for Joists & Joists Girders
(Pressures shown are service level.)

General:

1. The structural systems shown on these documents have been designed for the final, in place usage of the structure based on the intended occupancy and code requirements. While general constructability has been considered, the structural systems have not been designed to accommodate specific construction means and methods that might be utilized by the Contractor.

2. The Contractor shall field verify all existing dimensions prior to fabrication.

3. The Contractor shall notify the Engineer of any observed discrepancies in dimensions, detailing, or other items as shown on the plans or specified prior to proceeding with work relating to said discrepancies.

4. The Contractor shall not alter or modify work shown on the structural drawings without receiving written approval from the Engineer.

5. The Contractor shall be responsible for supplying shop drawings for wood and metal joists & trusses, joist girders, bar joists, structural steel, metal deck, reinforcing steel, concrete masonry units and accessories, plan and elevation views of concrete masonry wall elevations including control joint and expansion joint locations, mortar and grout, and concrete mix designs. Shop drawings must be reviewed for conformance with the means, methods, techniques, sequences, and operations of construction, and safety precautions and programs incidental thereto, all of which are the sole responsibility of the Contractor, and shall be stamped "approved" by the Contractor prior to submittal. Shop drawings submitted without the Contractor's stamped approval will be returned "rejected". All shop drawings shall be reviewed by the Structural Engineer prior to construction.

6. See architectural, mechanical, and electrical drawings for other pertinent information related to the structural work and coordinate as required. These structural drawings are intended to be included in a complete set of construction documents, including but not limited to, architectural drawings, civil drawings, and mechanical/electrical/plumbing drawings. Contractor shall verify coordination of these drawings with contents of above drawing sets specified and only proceed with bidding and construction after such has taken place.

7. The building and the independent structural components shown in these documents are not structurally stable until all connections, framing, shear walls, diaphragms, permanent bracing, metal decking, interior and exterior concrete slabs on grade, and exterior or interior load-bearing walls are complete and have achieved their design strength. Contractor is solely responsible for maintaining structural stability during erection and construction. Temporary bracing systems shall remain in place until all structural work is complete.

8. The Contractor is responsible for verifying all existing dimensions and conditions of the existing building and reporting discrepancies from the assumed conditions shown on the structural drawings to the Engineer of record prior to fabrication and erection of any member.

9. The Contractor shall coordinate the roof drainage system with the Architect as required to ensure that no more than 3 1/2" of water can accumulate before entering an overflow drainage system.

Structural Engineer Site Observations:

1. The contract structural drawings & specifications 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.

2. The Engineer shall not have control nor charge of and shall not be responsible for, construction means, methods, techniques, sequences, or procedures, for safety precautions & programs in connection with the work, for the acts or omission of the Contractor, subcontractor, or any other persons performing any of the work, or for the failure of any of them to carry out the work in accordance with the contract documents.

3. Periodic site observation by field representatives of BSE Structural Engineers LLC. is solely for the purpose of determining if the work of the Contractor is proceeding in general accordance with the structural contract documents. This limited site observation should not be construed as exhaustive or continuous to check the quality or quantity of work, but rather periodic in an effort to guard the Client against defects or deficiencies in the work of the Contractor.

Slab On Grade:

1. Welded wire fabric shall be supplied in sheets only. Rolls will not be permitted. (As required on construction documents.)

2. Welded wire fabric shall be supported on chairs or blocks prior to concrete placement. Mesh shall not be hooked and pulled up during concrete placement. (As required on construction documents.)

3. Welded wire fabric shall have end and edge laps of one full mesh plus 2" between cross wires. Wire all laps securely together.

4. Welded wire fabric shall conform to ASTM A1064.

5. Floor finish requirements: Slab-on-grade shall be finished to overall floor flatness, overall floor levelness, local floor flatness, and local floor levelness requirements as defined by the Owner. Coordinate requirements as required with G.C. prior to slab-on-grade placement. Floor finish requirements to be determined in accordance with ASTM E 1155.

Foundations:

1. Foundations for this project have been designed in accordance with requirements set forth in a geotechnical report prepared by Kansas City Testing and Engineering, 04/25/2022, #G20-22-022. Continuous and individual footings have been designed for an allowable soil bearing value of 2,000 psf and 2,000 psf, respectively. The Contractor shall refer to the Geotechnical Report for all requirements and recommendations pertinent to this project.

2. Anchor rods shall conform to ASTM F1554 Gr. 36 (U.N.O.) and shall be located by means of a template. Provide a nut above and below template to assure proper vertical alignment.

3. All foundations shall be square and level.

4. Grout shall be dry and stiff to prevent shrinkage, with a minimum compressive strength of 4000 psi. Grout below column base plates and precast panels as required. Thoroughly compact grout beneath base plates.

Concrete and Reinforcing Steel:

1. Concrete mix designs shall meet the following requirements:

Location	Minimum Compressive Strength (psi)	Max. Aggregate Size	Max. Water/Cement Ratio	Slump (in.)	Air Entrainment (%)
Interior Slabs	4000	3/4"	0.50	4 ± 1	0
Exterior Slabs	3500	3/4"	0.50	4 ± 1	6 ± 1
Interior Foundations	3000	1"	0.50	4 ± 1	0
Perimeter Foundations	3000	1"	0.50	4 ± 1	6 ± 1
Exterior Walls & Pedestals	4000	3/4"	0.50	4 ± 1	6 ± 1

2. Fly ash shall not be used unless approved in writing by the Engineer. Fly ash, if approved, shall conform to ASTM C618 and ACI 232.2R-96. Fly ash shall be limited to types C & F and shall not exceed 15% of the total cement mass.

3. The use of admixtures to increase the slump shall not be used unless approved in writing by the Engineer.

4. All concrete is reinforced unless specifically called out as unreinforced. Reinforce all concrete not otherwise shown with same steel as in similar sections or areas.

5. Construction joints in grade beams shall be at midspan unless noted otherwise. Reinforcing steel shall be continuous through construction joints unless noted otherwise.

6. No aluminum items shall be embedded in any concrete or placed in contact with concrete.

7. Reinforcing bars #4 and larger (except ties and stirrups) shall meet ASTM A615 with Supplementary Requirements (S1), Grade 60. Smaller bars shall be Grade 40.

8. Concrete coverage of reinforcement shall have the following clear distances unless noted otherwise on the drawings:

Cast against earth: 3"

Formed concrete exposed to earth or weather: 2"

Not exposed to earth or weather: 1" Slabs, 1 1/2" Beams and columns

9. Embedded and all reinforcing bars marked continuous shall be embedded to develop the full tensile capacity of the bar. Laps shall be Class B tension laps unless specified otherwise on the drawings. Unless shown otherwise, splice top bars near midspan and splice bottom bars over supports.

10. Supply corner bars 4'-0" long (min. 2'-0" in each direction) in outside face of wall at corners of all walls and grade beams, matching size and spacing of horizontal bars. Where there are no vertical bars in outside face of wall, supply three (3) - #4 vertical support bars for corner bars.

11. All bars are to be supported in forms and spaced with wire bar supports per ACI "Manual of Standard Practice for Detailing Concrete Structures" (latest edition). Bars shall be securely wired per the latest edition of CRSI's "Recommended Practice for Placing Reinforcing Bars." Accessories for exposed concrete shall be plastic or shall have plastic-tipped feet.

12. Concrete placed during cold weather shall conform to the requirements of the most recent version of ACI 306R. Cold weather is defined as a period when, for more than 3 successive days, the mean daily temperature drops below 40°F.

13. Concrete placed during hot weather shall conform to the requirements of the most recent version of ACI 305R. Hot weather is defined as that combination of air temperature, concrete temperature, relative humidity and wind speed that will cause a rate of evaporation of 0.2 lb/sq.ft./hr. or more as defined by Figure 2.1.5 of ACI 305R.

14. Do not add water to concrete during delivery, at Project Site, or during placement, unless approved by the Engineer.

15. Provide 3/4" chamfer on all exposed corners unless noted otherwise on architectural or structural construction documents.

16. All cold joints shall be roughened and cleaned unless noted otherwise.

17. Vertical control joints in walls shall be placed at 30'-0" maximum spacing unless noted otherwise. Locate joints beside piers monolithic with walls, near corners, and in concealed locations where possible. Construction joints may be placed in lieu of control joints at contractors discretion. Coordinate location of control joints with Architect.

18. Refer to the geotechnical report for behind wall drainage recommendations. G.C. to coordinate with civil drawings as required. Refer to architectural drawings for foundation waterproofing and insulation requirements.

19. Macro-Synthetic Fiber Reinforcement shall be used for the purpose of controlling temperature and drying shrinkage cracking. Fibers shall provide a minimum post-crack residual strength capacity of 250 psi as measured by ASTM C1399, and shall meet the requirements of ASTM C1116 for Type III synthetic fibers. Minimum fiber length shall be 1.5 inches, minimum tensile strength shall be 70 ksi when tested by ASTM D2256 and minimum aspect ratio shall be 70.

Post-Installed Anchors:

1. Post-Installed anchors shall only be used where specified in the construction documents or approved by the engineer.

2. The Contractor shall obtain written approval from the Engineer prior to installing post-installed anchors for misplaced-placed anchors.

3. Care shall be taken with placing post-installed anchors to avoid damaging existing reinforcement.

4. The holes shall be drilled and cleaned in accordance with the manufacturer's specifications.

5. Post-installed anchors shall meet ACI 318 Appendix D criteria. The following are acceptable post-installed anchors:

All adhesive anchoring systems referred to in these drawings shall be one of the following:
a. Hilti HIT HY 200 V3
b. Powers AC100+ Gold
c. Simpson Strong-Tie SET-3G
d. Or Approved Equivalent

All screw anchors referred to in these drawings shall be one of the following:
a. Hilti KH-EZ
b. Powers Wedge Bolt+
c. Simpson Strong-Tie Titan HD
d. Or Approved Equivalent

Masonry:

1. Mortar shall be Type S for all masonry work and must achieve a minimum compressive strength of 1800 psi at the 28-day test. Masonry units shall have a minimum strength of f'm = 1900 psi.

2. Masonry grout shall be a coarse-type grout and must achieve a minimum compressive strength of 2000 psi at the 28-day test. Slump shall range from 8" minimum to 10" maximum. Grout materials and proportions shall conform to ASTM C476.

3. All masonry shall be reinforced with horizontal 9 gauge truss type reinforcement at 16" o.c. vertical or as shown on the drawings.

4. Vertical reinforcing shall be installed as noted on the drawings. Reinforcing bars shall be lapped as specified on the design drawings. If no lap length is shown, contact the Engineer.

5. Vertical control joints in masonry shall be 3/8" wide, full height of wall at locations shown on the Architectural drawings. Joints shall be spaced at a maximum of 25'-0" apart and coordinated with the Architect. All horizontal joint reinforcing shall be discontinuous at masonry control joints. Refer to typical details for additional information

6. Lintels over openings shall be installed as indicated on the drawings. If no lintels are indicated, notify the Engineer.

7. Provide at least (1) vertical rebar at each end of each wall, side of control joints, jambs, corner, and intersection of all reinforced masonry walls. Size of rebar to match the size of typical vertical reinforcing shown.

8. Provide (1) corner bar at each horizontal bond beam. Size of rebar to match typical bond beam reinforcing shown.

9. Submit shop drawings including plan and elevation views of reinforced masonry walls including bond beams, control joints, expansion joints, and lintels.

10. All steel beams bearing on masonry shall have (3) cores minimum grouted full directly below the bearing locations unless noted otherwise.

11. All bond beam reinforcing shall continue through control joints.

12. All cells containing reinforcement, bolts, or other metal anchors shall be grouted solid. Any cells below grade shall be grouted solid whether reinforced or not.

Structural Steel:

1. All structural steel shall conform to the following (U.N.O.):

Structural Steel Wide Flanges:	ASTM A992
Miscellaneous Steel:	ASTM A36
Structural Tubing:	ASTM A500, Grade B (Fy = 46 ksi)
Steel Pipe:	ASTM A53, Type E or S, Grade B

2. Bolts shall be as follows (U.N.O.):

Connection Bolts:	ASTM A325
Anchor Rods:	ASTM F1554, Grade 36
Shear Studs:	ASTM A108, Grade 1015 through 1020

3. Welding shall conform to the latest publication of applicable codes set forth by the American Welding Society. Welding electrodes shall be E70XX.

4. All exterior steel exposed to weather shall be hot-dipped galvanized and/or painted per Architect unless noted other wise.

5. Weld all joists to supporting members with 1/8" x 2" long fillet welds on each side of the joist. In steel frames, where columns are not framed in at least two directions with structural steel members, joists at column lines shall be field-bolted at the columns to provide lateral stability during construction.

6. All roof bar joists shall be designed for uplift as stipulated by the applicable building code. Extra bracing shall be added as required, and the joist manufacturer shall certify that the joists have been designed for reverse bending due to uplift.

7. All bar joists shall be designed to resist loads induced by fascia panel bracing members.

8. All bar joists shall have horizontal bridging as recommended by the Steel Joist Institute. Provide rigid "X" bridging in addition to horizontal bridging where horizontal bridging is discontinuous, unless horizontal bridging is connected to a wall at the top and bottom of the joist. Refer to the plans for other locations of "X" bridging. The erector shall follow the latest requirements of the Steel Joist Institute regarding additional bolted "X" bridging required for erection stability.

9. All pipe hangers supporting more than 100 lbs. and being supported from steel bar joists or joist girders shall be hung from top chords and within 2" of web panel points. If interferences exist that will not allow pipe to be hung in this manner, the Contractor shall notify the Engineer for required modifications.

10. All openings in the roof shall be framed with a 4 x 4 x 1/4 angle minimum, unless noted otherwise. Mechanical units shall be supported with structural steel frames as required. If framing is not shown for mechanical units, notify the Engineer.

11. All steel stairs shall be designed by the steel stair manufacturer in compliance with the governing building code to meet 100 psf design live load.

Light Gauge Metal Framing:

1. All light gauge structural studs, track and accessories shall be designed in accordance with the latest edition of the American Iron and Steel Institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members," and shall be of type, size, gauge and spacing shown on the drawings.

2. All 16 gauge and heavier studs and joists shall be formed from corrosion-resistant steel corresponding to the requirements of ASTM A446, with a minimum yield strength of 50 ksi. All 18 gauge and lighter studs, joists, track and accessories shall be formed from corrosion-resistant steel corresponding to the requirements of ASTM A446, with a minimum yield strength of 33 ksi.

3. Prior to fabrication of framing, the Contractor shall submit fabrication and erection drawings to the Architect/Engineer for approval.

4. Prefabricated panels shall be square, with components attached in a manner to prevent racking and minimize distortion while lifting. The Contractor shall provide temporary bracing where required.

5. All framing components shall be cut squarely for attachment to perpendicular members, or as required, for angular fit against abutting members. Splicing of axial loaded members is not permitted.

6. Axially loaded studs shall be installed in a manner which will assure that their ends are positioned against the inside of the track web prior to fastening. Studs shall be securely fastened to both flanges of the top and bottom track.

7. Fastening of components shall be with self-drilling screws or welding. Wire tying of components shall not be permitted. Screws shall be of sufficient size to ensure the strength of connection. All connections shall be made with a minimum of (2) #10 screws or 1/8" fillet weld two inches long. All welds shall be touched up with a zinc-rich paint.

8. Tracks shall be securely anchored to the supporting structure as shown on the drawings. Abutting lengths of tracks shall be securely anchored to a common structural element, butt-welded or spliced together.

9. Wall stud bridging shall be attached in a manner to prevent stud rotation. Bridging rows shall be spaced according to manufacturer's specifications or recommendations. 4'-0" maximum spacing between rows of bridging.

10. Provision for structure vertical movement shall be provided where indicated on the drawings.

11. Minimum thickness values of framing specified in gauge values on drawings are as follows:

Minimum Design Thickness (in.)	Design Thickness (in.)	Inside Corner Radius (in.)	Gauge No. (Reference Only)
18	0.0188	0.0843	25
27	0.0283	0.0796	22
30	0.0312	0.0781	20 - Drywall
33	0.0346	0.0764	20 - Structural
43	0.0451	0.0712	18
54	0.0566	0.0849	16
68	0.0713	0.1069	14
97	0.1017	0.1525	12

NOTE: Minimum Thickness represents 95% of the design thickness and is the minimum acceptable thickness delivered to the job site based on Section A3.4 of the 1996 AISI Specification.

Special Inspector:

1. The following items require special inspection in accordance with the building code.
   a. Reinforced masonry construction - level 1 inspection
   b. Concrete & masonry grout design mix
   c. Placing of concrete & reinforcing steel
   d. Bolts & anchors embedded in concrete & masonry
   e. Concrete formwork
   f. Structural steel fabrication
   g. Structural steel bolting & welding
   h. Inspection of roof & deck attachment
   I. Post installed anchors in masonry & concrete
   J. In-situ soils, excavations, filling & compaction

2. The Contractor shall request special inspection of the items listed above prior to those items becoming inaccessible & unobservable due to progression of the work.

3. The Special Inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring special inspection.

4. The Special Inspector shall observe the work assigned for conformance with the approved design drawings and specifications.

5. The Special Inspector shall furnish inspection reports to the Building Official, the Engineer and Architect of record, and other designated persons. All discrepancies shall be brought to the immediate attention of the Contractor for correction, then if uncorrected, to the proper design authority and to the Building Official.

6. The Special Inspector shall submit a final signed report stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable workmanship provisions of the governing building codes.

Earthwork:

1. The Inspector must verify that the preparation of the natural ground and the placement of engineered fill is performed in accordance with the GEOTECHNICAL engineer's recommendations as stated in the GEOTECHNICAL report.

2. The Inspector must monitor the placement of all fill to determine whether the type of material, moisture content, and degree of compaction are within the recommended limits contained in the GEOTECHNICAL report. Proceed with subsequent earthwork only after test results for previously completed work comply with recommended limits contained in the GEOTECHNICAL report.

3. All Subgrade supporting footings and slabs must be inspected immediately prior to the placement of reinforced concrete.

4. Paved and building slab areas shall be tested at Subgrade and at each compacted fill and backfill layer, at least once for every 2000 sq. ft. or less of paved or building slab areas, but in no case fewer than 3 tests.

5. Foundation wall backfill shall be tested at each compacted initial and final backfill layer, at least once for each 100 ft. or less of wall length, but no fewer than 2 tests.

6. Trench backfill shall be tested at each compacted initial and final backfill layer, at least once for each 150 ft. or less of trench length, but no fewer than 2 tests.

7. Test compaction of soils-in-place in accordance with ASTM D 1556, ASTM D 2167, ASTM D 2922, and ASTM D 2937, as applicable.

8. Test Reporting: Test results must be reported to BSE and the general contractor in writing within 24 hours after testing. via fax. Reports must contain the project name, the date of the test and the location of the test.

Concrete:

1. Strength test cylinders shall be prepared for each day's pour of each concrete mix and at a minimum frequency of every 50 cu. yd. on all concrete placed. Conform to ASTM C39.

2. Four (4) test cylinders are to be made and cured on site for the first 24 hours. Test one of the specimens at 7 days and two at 28 days. Hold the fourth specimen in reserve for later testing if needed.

3. Slump, air content and temperature tests shall be conducted at a minimum when strength specimens are made and at any other times as specified by the Engineer.

4. Perform slump tests on a representative concrete sample at the point of discharge. Perform additional tests when concrete consistency seems to have changed. The maximum allowable field slump is 5 inches. Conform to ASTM C143.

5. Perform air content tests on all concrete specified to be air-entrained. Conform to ASTM C231.

6. Perform a temperature test every hour when air temperature is 40°F and below, or when air temperature is 80°F and above. Conform to ASTM C 1064.

7. Prior to the closing of forms or the delivery of concrete to the job site, the inspector shall verify that the reinforcing steel is in conformance with the city-approved plans, specifications and shop drawings. The inspector shall confirm that the reinforcing steel is of the correct size and grade and ensure that the proper spacing, clearances, splice lengths and embedded items have been provided. All reinforcing steel shall be in place prior to the placement of concrete and be secured against displacement.

8. The Inspector shall verify that the bolt size, location and embedment length of all anchor bolts are in conformance with the city-approved plans, specifications and shop drawings.

9. Anchor rods 3/4"Ø or smaller may be floated in place following concrete placement, provided that anchor bolts are worked easily by hand into the fresh concrete to allow for full contact with the shank of the bolt. Bolts shall be placed by means of a template and shall be worked into concrete in vertical alignment.

10. Test Reporting: Test results must be reported to BSE and the General Contractor in writing within 24 hours after testing, via fax or email. Reports of compressive strength tests must contain the project name, the date of concrete placement, the location of concrete placement within the structure and the concrete mix design being used.

Structural Steel:

1. Bolts: Bolts that are not identified as being slip-critical nor in direct tension need not be inspected other than to verify that the plies of connected elements are brought into snug-tight condition in properly-aligned holes.

2. Field Welding: Inspection is required for single-pass fillet welds, multi-pass fillet welds, complete- and partial-penetration groove welds, floor and roof deck welding, and stairs and railing systems. Prior to the start of the work, materials, qualifications of welding procedures and welder qualifications shall be verified. Provide continuous or periodic inspection of the structural welding as indicated in Table 1704.3 of the referenced IBC. Inspections may occur periodically, as defined below. A visual inspection to ensure proper type, size, length and quality of all field welds is required prior to work being concealed by other materials.

3. Periodic inspection: "Periodic" is defined as generally once a week at a minimum, and more often as needed to observe work requiring inspections, as outlined above, prior to being covered by subsequent construction.

4. Shear connector stud welds will be inspected and tested according to AWS D1.1 for stud welding. Shear connector stud welds shall be visually inspected. Bend tests shall be performed if visual inspections reveal less than a 360-degree flash or welding repairs to any shear connector stud.

5. Structural steel bar joists and metal buildings fabricated on the premises of a facility/plant not certified by a nationally recognized organization, shall have in-plant special inspections. AISC, ICBO, CWB and SJI are certified fabricators.

6. Test Reporting: Test results must be reported to BSE and the General Contractor in writing within 24 hours of testing, via fax or email. Reports must contain the project name, the date of the test and the location of the test.

Masonry:

1. Mortar properties, grout, brick, concrete masonry unit and prism tests and evaluations are to be performed during construction for each 5,000 sq. ft. of wall area or portion thereof.

2. Mortar properties are to be tested per ASTM C 780.

3. Grout will be sampled and tested for compressive strength per ASTM C 1019.

4. Brick tests for each type and grade of brick indicated are to be performed according to ASTM C 67.

5. Concrete masonry unit tests for each type of concrete masonry unit indicated are to be performed per ASTM C 140.

6. Masonry prisms are to be tested per ASTM C 1314. Prepare one (1) set of prisms for testing at 7 days and one (1) set for testing at 28 days.

7. Special inspection of masonry construction is required during preparation and taking of any required prisms or test specimens, placing of all masonry units, placement of reinforcement and inspection of grout space immediately prior to closing cleanouts, and during all grouting operations.

8. Test Reporting: Test results must be reported to BS and the general contractor in writing within 24 hours of testing, via fax. Reports must contain the project name, the date of the test and the location of the test.

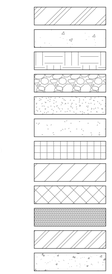
ABBREVIATIONS LIST

&	AND
@	AT
°	DEGREES
=	EQUALS
'	FEET
>	GREATER THAN
≥	GREATER THAN OR EQUAL TO
"	INCHES
<	LESS THAN
≤	LESS THAN OR EQUAL TO
-	MINUS, NEGATIVE
+	PLUS
±	PLUS OR MINUS
A.F.F	ABOVE FINISHED FLOOR
ALT.	ALTERNATE
ARCH.	ARCHITECT
BLDG.	BUILDING
BM.	BEAM
B.O.S.	BOTTOM OF STEEL
BOTT.	BOTTOM
C.J.	CONTROL/CONSTRUCTION JOINT
CL	CENTER LINE
C.M.U.	CONCRETE MASONRY UNIT
CLG.	CEILING
CLR.	CLEAR
COL.	COLUMN
CONC.	CONCRETE
CONT.	CONTINUOUS
COORD.	COORDINATE
CTR.	CENTER
DIA.	DIAMETER
DN.	DOWN
DWG.	DRAWING
E.J.	EXPANSION JOINT
E.O.R.	ENGINEER OF RECORD
EA.	EACH
EL.	ELEVATION
ELEV.	ELEVATION
ENG.	ENGINEER
EQ.	EQUAL
EQUIP.	EQUIPMENT
ETC.	ET CETERA
EXIST.	EXISTING
EXT.	EXTERIOR
F.A.	FACE
F.B.E.	FOOTING BEARING ELEVATION
F.F.E.	FINISHED FLOOR ELEVATION
F.S.	FAR SIDE
FT.	FOOT/FEET
FTG.	FOOTING/FOUNDATION
G.C.	GENERAL CONTRACTOR
GALV.	GALVANIZED
GYP.	GYPSUM
HORIZ.	HORIZONTAL
IN	INCHES
J.B.E.	JOIST BEARING ELEVATION
JT.	JOINT
KSI	KIPS PER SQUARE INCH
K	KIPS
L.F.	LINEAR FEET
LB.	POUND
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
M.B.M.	METAL BUILDING MANUFACTURER
M.E.P.	MECHANICAL ELECTRICAL PLUMBING
MAX.	MAXIMUM
MIN.	MINIMUM
MISC.	MISCELLANEOUS
N.A.	NOT APPLICABLE
N.S.	NEAR SIDE
N.T.S.	NOT TO SCALE
Ø	DIAMETER
P.E.M.B.	PRE-ENGINEERED METAL BUILDING
PL.	PLATE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
R	RADIUS
REINF.	REINFORCED
REQ'D.	REQUIRED
SF	SQUARE FEET
SIM.	SIMILAR
SPA.	SPACING
SPEC.	SPECIFICATION
SQ.	SQUARE
T.O.C.	TOP OF CONCRETE
T.O.F.	TOP OF FOOTING
T.O.S.	TOP OF STEEL
T.O.W.	TOP OF WALL
THRU.	THROUGH
TYP.	TYPICAL
U.N.O.	UNLESS NOTED OTHERWISE
VERT.	VERTICAL
W.W.F.	WELDED WIRE FABRIC
WT.	WEIGHT
W/	WITH
W/O	WITHOUT

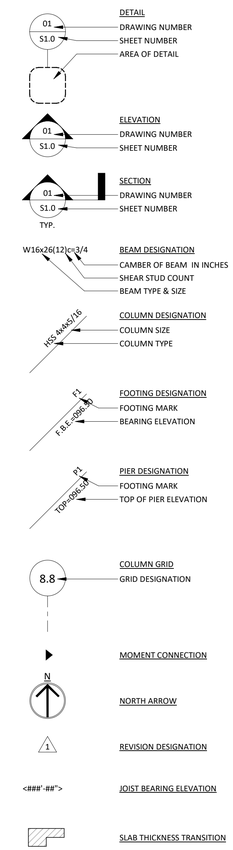
SHEET LIST

Sheet Number	Sheet Name
S0.0	GENERAL NOTES
S0.1	ISOMETRIC
S1.1	FOUNDATION PLAN
S2.2	ROOF FRAMING PLAN
S3.1	TYPICAL FOUNDATION DETAILS
S3.2	FOUNDATION DETAILS
S4.1	TYPICAL FRAMING DETAILS
S4.2	FRAMING DETAILS

MATERIALS LEGEND



SYMBOLS LEGEND



davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com

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11320 West 79th Street
Lenexa, Kansas 66214
Phone 913.492.7400
www.BSEstructural.com
Project Number 22-365

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.22
drawn by
Author
checked by
Checker
revisions
09.12.22
12.23.22
PDP
permit

STATE OF MISSOURI
KEVIN S. BOEHRINGER
NUMBER E-29757
12/23/22
PROFESSIONAL ENGINEER

sheet number
S0.0
GENERAL NOTES

drawing type
project number

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4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com

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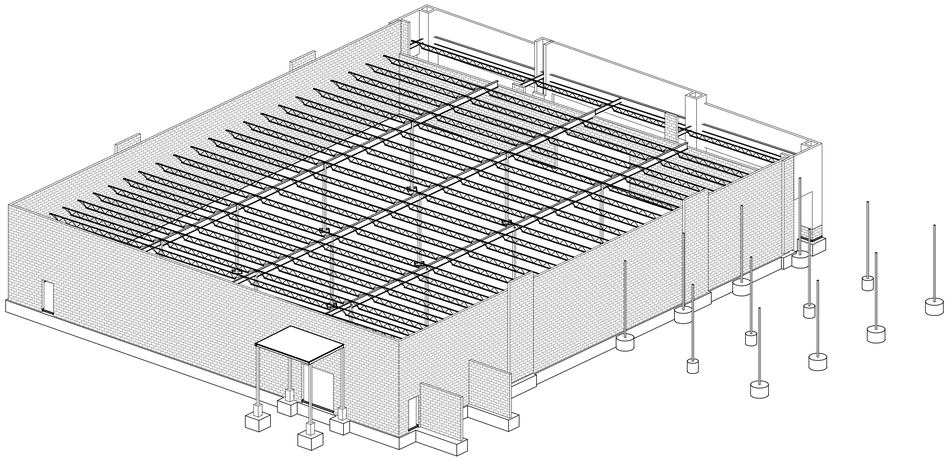
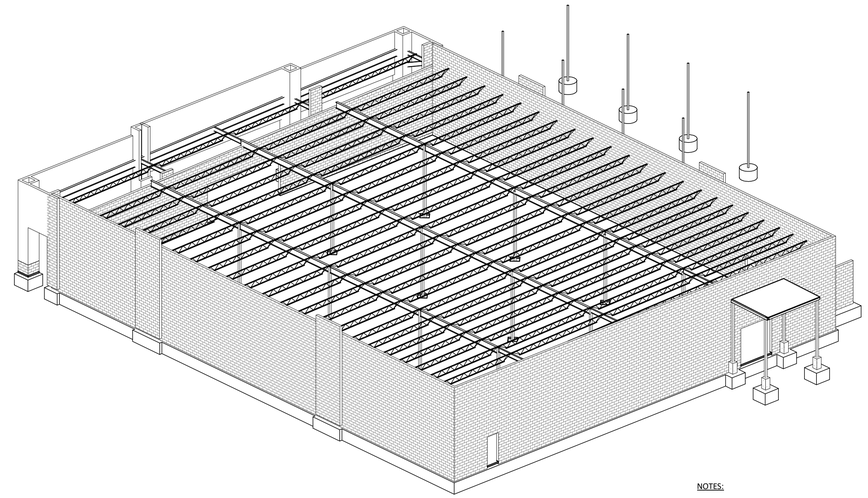


NOTES:

1.) ISOMETRIC VIEWS ARE SHOWN FOR SCHEMATIC PURPOSES ONLY. ACTUAL CONSTRUCTION TO MATCH CONSTRUCTION DOCUMENTS. REFERENCE ARCHITECTURAL, MECHANICAL, CIVIL, & STRUCTURAL DOCUMENTS.

ISOMETRIC | 01
S0.1



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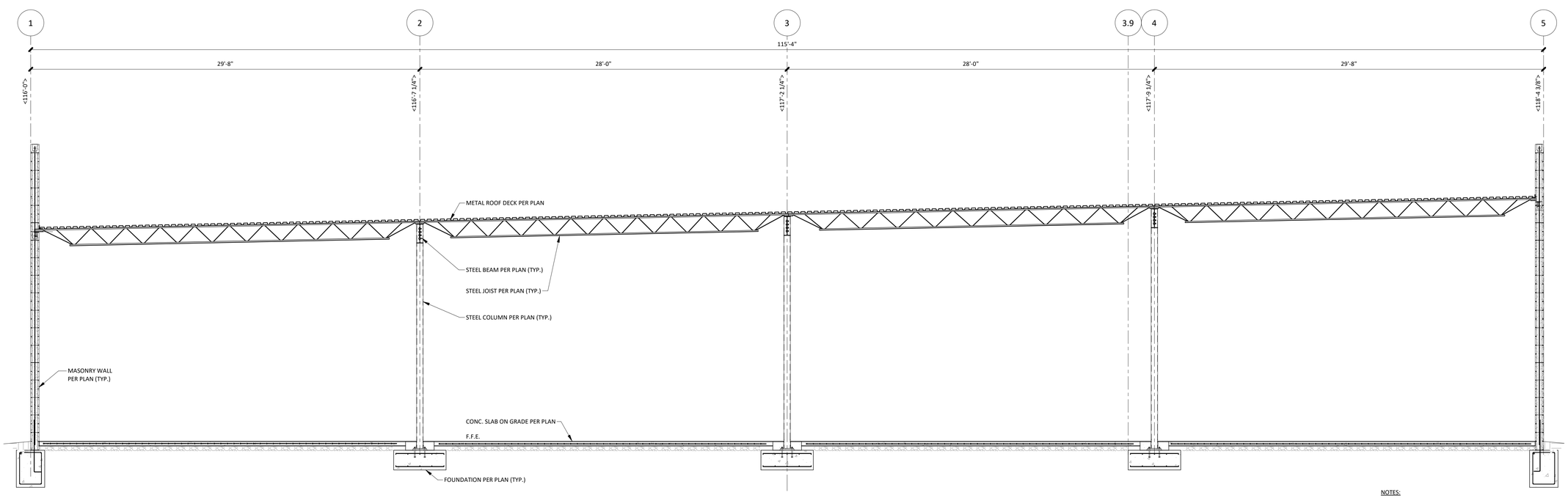
BACK ISOMETRIC | 02
S0.1



NOTES:

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BUILDING SECTION | 03
1/4" = 1'-0" | S0.1

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.22
drawn by
Author
checked by
Checker
revisions
09.12.22 PDP
12.23.22 permit

STATE OF MISSOURI
KEVIN S. BOEHRINGER
NUMBER E-29757
12/23/22
PROFESSIONAL ENGINEER

sheet number
S0.1
ISOMETRIC

drawing type
project number

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Lee's Summit, Missouri
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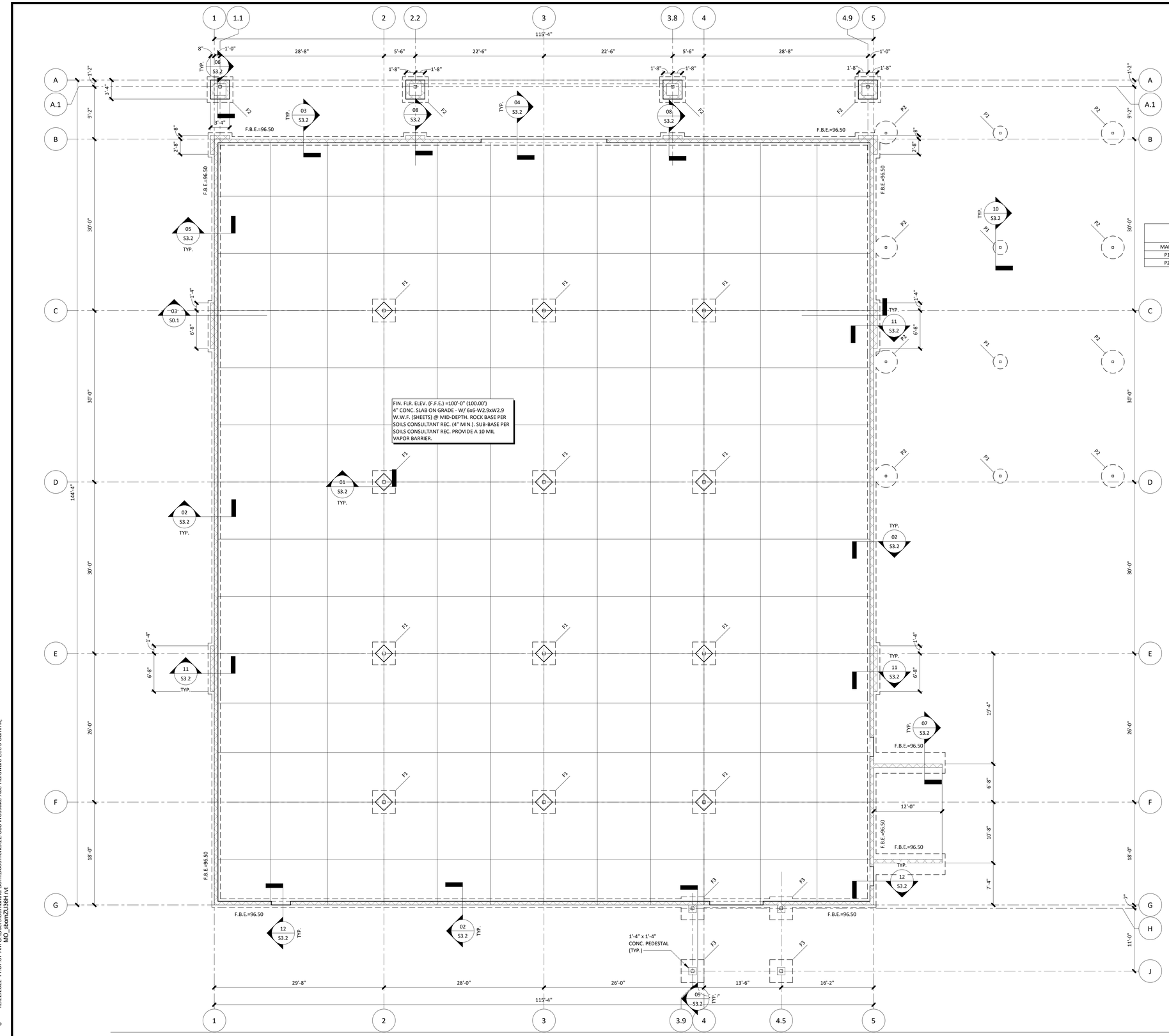

FOUNDATION SCHEDULE				
MARK	DIMENSIONS	REINFORCEMENT	F.B.E.	COMMENTS
F1	4'-0" x 4'-0" x 1'-6"	#4 @ 12" SPA. EA. WAY TOP & BOTT.	97.83	
F2	4'-6" x 4'-6" x 2'-10"	#5 @ 12" SPA. EA. WAY TOP & BOTT.	96.50	
F3	4'-0" x 4'-0" x 2'-10"	#4 @ 12" SPA. EA. WAY TOP & BOTT.	96.50	

DRILLED PIER SCHEDULE					
MARK	PIER DIAMETER	VERT. REINFORCEMENT	PIER TIES	T.O.P.	B.O.P.
P1	30"	(10) #6	#3 @ 10" SPA.	99'-0"	96'-6"
P2	48"	(10) #6	#3 @ 10" SPA.	99'-0"	96'-6"

NOTES:

1.) SEE DRAWING S0.0 FOR GENERAL NOTES, SYMBOLS LEGEND, MATERIALS LEGEND, & ABBREVIATION LIST.

2.) REFERENCE DRAWING S3.1 FOR TYPICAL FOUNDATION DETAILS INCLUDING ANCHOR ROD DETAILS, FOOTING STEP DETAILS, CONTROL JOINT & CONSTRUCTION JOINT DETAILS, REINF. LAP LENGTH TABLE, ETC.

3.) SEE DRAWING S0.1 FOR ISOMETRIC VIEW & FULL BUILDING SECTIONS.

4.) MASONRY CMU WALLS ARE 8" U.N.O.

5.) REINF. SHALL BE INSTALLED FULL DEPTH OF PIERS.

6.) VERIFY BEARING W/ GEOTECHNICAL ENGINEER.

7.) REFER TO GEOTECHNICAL REPORT FOR BEHIND WALL DRAINAGE RECOMMENDATIONS. COORD. W/ CIVIL AS REQ'D. REFER TO ARCHITECTURAL DRAWINGS FOR FOUNDATION WATERPROOFING & INSULATION REQUIREMENTS.

FOUNDATION PLAN | 01
1/8" = 1'-0" | S1.1

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
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FOUNDATION PLAN

drawing type
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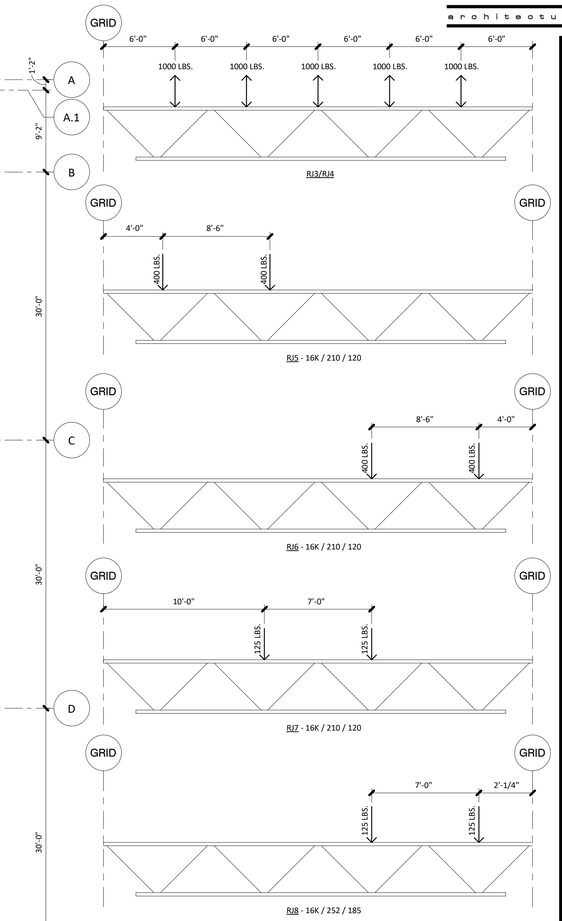
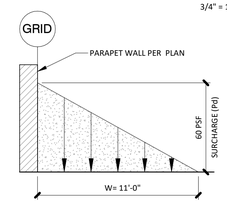
ROOF FRAMING PLAN | 01
1/8" = 1'-0" | S2.2



ADDITIONAL JOIST VERTICAL LOADING DIAGRAMS | 02
3/4" = 1'-0" | S2.2



*SNOW DRIFT LOADS SHALL BE SUPERIMPOSED ONTO THE FLAT ROOF SNOW LOADS

SNOW DRIFT DIAGRAM
3/8" = 1'-0"

RJ1 = 16K / 210 / 120
RJ2 = 16K / 252 / 185
RJ3 = 18K / 279 / 202
RJ4 = 16K / 279 / 202
RJ5 = 16K / 210 / 120
RJ6 = 16K / 210 / 120
RJ7 = 16K / 210 / 120
RJ8 = 16K / 252 / 185

NOTES:

1.) SEE DRAWING S0.0 FOR GENERAL NOTES, SYMBOLS LEGEND, MATERIALS LEGEND, & ABBREVIATION LIST.

2.) REFERENCE DRAWING S4.1 FOR TYPICAL FRAMING DETAILS.

3.) SEE DRAWING S0.1 FOR ISOMETRIC VIEW & FULL BUILDING SECTIONS.

4.) REFERENCE ARCHITECTURAL DRAWINGS TO VERIFY SIZE & LOCATIONS OF ALL ROOF & WALL OPENINGS.

5.) PROVIDE JOIST BRIDGING PER SJI REQUIREMENTS.

6.) * = JOIST TO BE DESIGNED FOR ADDITIONAL SNOW DRIFT - SEE SNOW DRIFT DETAIL

7.) MASONRY CMU WALLS ARE 8" U.N.O.

8.) REFERENCE DRAWING S4.1 FOR TYPICAL MASONRY LINTEL DETAILS.

9.) ALL EXTERIOR LINTELS SUPPORTING STONE OR BRICK SHALL BE GALVANIZED U.N.O. ON ARCHITECTURAL DRAWINGS.

10.) RJ3 & RJ4 TO BE DESIGNED WITH 1.5K UPLIFT FORCE @ 6'-0" MAX. SPA.

davidson architecture&engineering
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STATE OF MISSOURI
KEVIN S. BOEHRINGER
NUMBER E-29757
12/23/22
PROFESSIONAL ENGINEER

sheet number
S2.2
ROOF FRAMING PLAN

drawing type
project number

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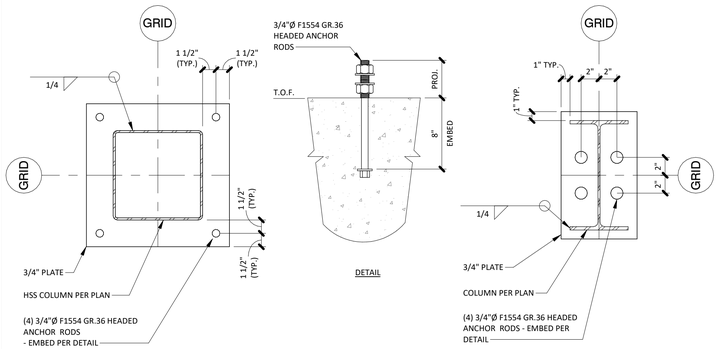
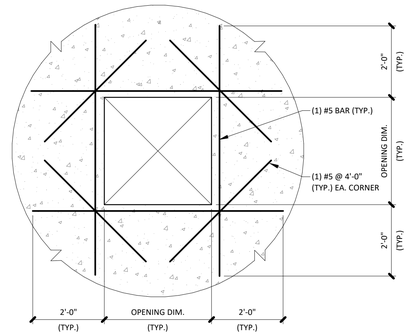
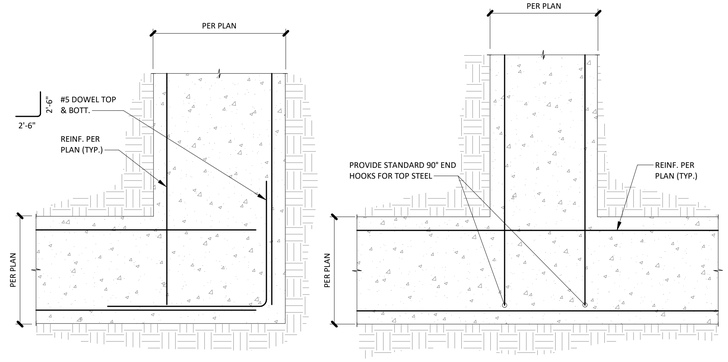
NOTES:
1.) FOR STANDARD SIZE HOLES, PROVIDE ASTM F844 (USS STANDARD) WASHERS. FOR HOLES THAT ARE MORE THAN 5/16" LARGER THAN ANCHOR ROD DIAMETER, PROVIDE PLATE WASHERS BETWEEN NUT & PLATE PER TABLE 14-2 IN AISC STANDARD.
2.) FOR ANCHORS RODS 1" DIAMETER AND LARGER, PROVIDE PLATE WASHERS BETWEEN NUT & PLATE PER TABLE 14-2 IN AISC STANDARD.
WELD WASHER TO TOP OF BASE PLATE WITH 3/16" FILLET WELD.



TYP. ANCHOR ROD & BASE PLATE DETAIL | 01
1 1/2" = 1'-0" | S3.1



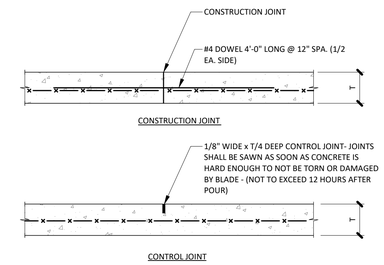
TYP. SLAB OPENING DETAIL | 02
1/2" = 1'-0" | S3.1



NOTE:
GRADE BEAMS SHALL BE POURED MONOLITHICALLY AROUND CORNERS.

NOTE:
GRADE BEAMS SHALL BE POURED MONOLITHICALLY AT INTERSECTIONS.

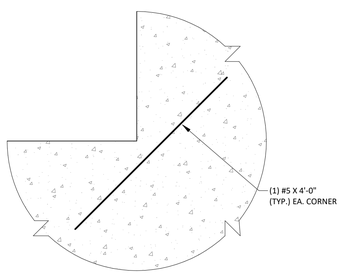
TYP. GRADE BEAM DETAILS | 03
3/4" = 1'-0" | S3.1



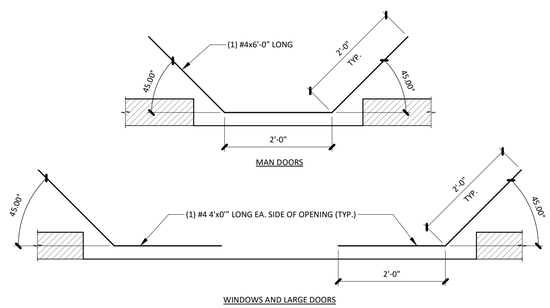
TYP. CONTROL & CONST. JOINT DETAIL | 04
3/4" = 1'-0" | S3.1

STANDARD HOOK TABLE	
BAR SIZE	HOOK
#4	8 in.
#5	10 in.
#6	12 in.
#7	14 in.
#8	16 in.

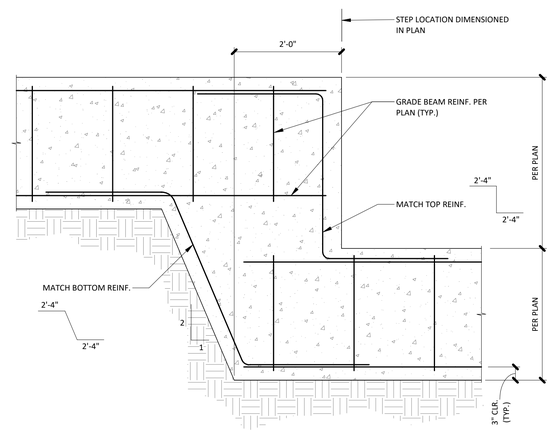
STANDARD 90° HOOK TABLE | 05
12" = 1'-0" | S3.1



TYP. RE-ENTRANT CORNER REINF. DETAIL | 06
3/4" = 1'-0" | S3.1



TYP. SLAB REINF. @ DOOR DETAIL | 07
3/4" = 1'-0" | S3.1



TYP. FOOTING STEP DETAIL | 08
3/4" = 1'-0" | S3.1

TENSION LAP SPLICE LENGTHS (in) GRADE 60 UNCOATED BARS f'c=3000 psi					
BAR SIZE	LAP CLASS	TOP BARS		OTHER BARS	
		CASE 1	CASE 2	CASE 1	CASE 2
#3	A	22	32	17	25
	B	28	42	22	32
#4	A	29	43	22	33
	B	37	56	29	43
#5	A	36	54	28	41
	B	47	70	36	54
#6	A	43	64	33	50
	B	56	84	43	64
#7	A	63	94	48	72
	B	81	122	63	94
#8	A	72	107	55	82
	B	93	139	72	107
#9	A	81	121	62	93
	B	105	157	81	121
#10	A	91	136	70	105
	B	118	177	91	136
#11	A	101	151	78	116
	B	131	196	101	151

NOTES:

1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL-WEIGHT CONCRETE.

2. TENSION DEVELOPMENT LENGTHS AND TENSION LAP SPLICE LENGTHS ARE BASED ON ACI 318, SECTIONS 12.2.2 AND 12.15, RESPECTIVELY.

3. TABULATED VALUES FOR BEAMS OR COLUMNS ARE BASED ON TRANSVERSE REINFORCEMENT AND CONCRETE COVER MEETING MINIMUM CODE REQUIREMENTS. LENGTHS ARE IN INCHES.

4. CASES 1 AND 2, WHICH DEPEND ON THE TYPE OF STRUCTURAL ELEMENT, CONCRETE COVER, AND THE CENTER-TO-CENTER SPACING OF THE BARS ARE DEFINED AS:

BEAMS OR COLUMNS:
CASE 1: COVER AT LEAST (1) BAR DIAMETER AND C.-C. SPACING AT LEAST (2) BAR DIAMETERS

CASE 2: COVER LESS THAN (1) BAR DIAMETER AND C.-C. SPACING LESS THAN (2) BAR DIAMETERS

ALL OTHERS:
CASE 1: COVER AT LEAST (1) BAR DIAMETER AND C.-C. SPACING AT LEAST (3) BAR DIAMETERS

CASE 2: COVER LESS THAN (1) BAR DIAMETER AND C.-C. SPACING LESS THAN (3) BAR DIAMETERS

5. LAP CLASS A VALUES ARE THE REQUIRED TENSION DEVELOPMENT LENGTHS, ld; LAP SPLICE LENGTHS ARE MULTIPLES OF TENSION DEVELOPMENT LENGTHS; CLASS A - 1.0ld AND CLASS B = 1.3ld (ACI 318, SECTION 12.15.1)

6. LAP CLASS B SHALL BE USED FOR ALL CASES UNLESS APPROVED BY E.O.R

7. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BARS.

8.) LENGTHS SHOWN ARE FOR UNCOATED BARS. LENGTHS SHOWN SHALL BE MULTIPLIED BY 1.2 FOR ALL EXPOXY COATED BARS (ACI 318 SECTION 12.2.4)

9.) WHEN BARS OF DIFFERENT SIZES ARE LAP SPLICED, THE SPLICE LENGTH FOR THE LARGER BAR SHALL BE USED.

LAP SPLICE LENGTHS f'c=3000 psi | 09
1/2" = 1'-0" | S3.1

COMPRESSION DEVELOPMENT AND LAP SPLICE LENGTHS GRADE 60 REINFORCEMENT, NORMAL WEIGHT CONCRETE						
BAR SIZE	CONCRETE COMPRESSIVE STRENGTH					
	3000 PSI		4000 PSI		5000 PSI	
	DEV	SPLICE	DEV	SPLICE	DEV	SPLICE
#3	9	12	8	12	7	12
#4	11	15	10	15	9	15
#5	14	19	12	19	12	19
#6	17	23	15	23	14	23
#7	20	27	17	27	16	27
#8	22	30	19	30	18	30
#9	25	34	22	34	21	34
#10	28	39	25	39	23	39
#11	31	43	27	43	26	43

NOTES:
1.) TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL WEIGHT CONCRETE.
2.) COMPRESSION DEVELOPMENT LENGTHS AND COMPRESSION SPLICE LENGTHS ARE BASED ON ACI 318, SECTIONS 12.3 AND 12.16, RESPECTIVELY.
3.) ALL VALUES ARE SHOWN IN INCHES
4.) COMPRESSION SPLICE PERMISSIBLE ONLY WHERE SPECIFICALLY NOTED
5.) TABLE IS NOT APPLICABLE FOR EPOXY-COATED REINFORCEMENT.
6.) "SIDE LAP" ALL LAP SPLICES TO MAINTAIN SPECIFIED CONCRETE COVER.
7.) WHEN BARS OF A DIFFERENT SIZE ARE LAP SPLICED, THE SPLICE LENGTH SHALI BE THE LARGER OF THE DEVELOPMENT LENGTH OF THE LARGER BAR, OR THE SPLICE LENGTH OF THE SMALLER BAR.

COMPRESSION DEVEL. & LAP SPLICE TABLE | 10
1/2" = 1'-0" | S3.1

TENSION LAP SPLICE LENGTHS (in) GRADE 60 UNCOATED BARS f'c=4000 psi					
BAR SIZE	LAP CLASS	TOP BARS		OTHER BARS	
		CASE 1	CASE 2	CASE 1	CASE 2
#3	A	19	28	15	22
	B	24	36	19	28
#4	A	25	37	19	29
	B	32	48	25	37
#5	A	31	47	24	36
	B	40	60	31	47
#6	A	37	56	29	43
	B	48	72	37	56
#7	A	54	81	42	63
	B	70	106	54	81
#8	A	62	93	48	72
	B	80	121	62	93
#9	A	70	105	54	81
	B	91	136	70	105
#10	A	79	118	61	91
	B	102	153	79	118
#11	A	87	131	67	101
	B	113	170	87	131

NOTES:

1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL-WEIGHT CONCRETE.

2. TENSION DEVELOPMENT LENGTHS AND TENSION LAP SPLICE LENGTHS ARE BASED ON ACI 318, SECTIONS 12.2.2 AND 12.15, RESPECTIVELY.

3. TABULATED VALUES FOR BEAMS OR COLUMNS ARE BASED ON TRANSVERSE REINFORCEMENT AND CONCRETE COVER MEETING MINIMUM CODE REQUIREMENTS. LENGTHS ARE IN INCHES.

4. CASES 1 AND 2, WHICH DEPEND ON THE TYPE OF STRUCTURAL ELEMENT, CONCRETE COVER, AND THE CENTER-TO-CENTER SPACING OF THE BARS ARE DEFINED AS:

BEAMS OR COLUMNS:
CASE 1: COVER AT LEAST (1) BAR DIAMETER AND C.-C. SPACING AT LEAST (2) BAR DIAMETERS

CASE 2: COVER LESS THAN (1) BAR DIAMETER AND C.-C. SPACING LESS THAN (2) BAR DIAMETERS

ALL OTHERS:
CASE 1: COVER AT LEAST (1) BAR DIAMETER AND C.-C. SPACING AT LEAST (3) BAR DIAMETERS

CASE 2: COVER LESS THAN (1) BAR DIAMETER AND C.-C. SPACING LESS THAN (3) BAR DIAMETERS

5. LAP CLASS A VALUES ARE THE REQUIRED TENSION DEVELOPMENT LENGTHS, ld; LAP SPLICE LENGTHS ARE MULTIPLES OF TENSION DEVELOPMENT LENGTHS; CLASS A - 1.0ld AND CLASS B = 1.3ld (ACI 318, SECTION 12.15.1)

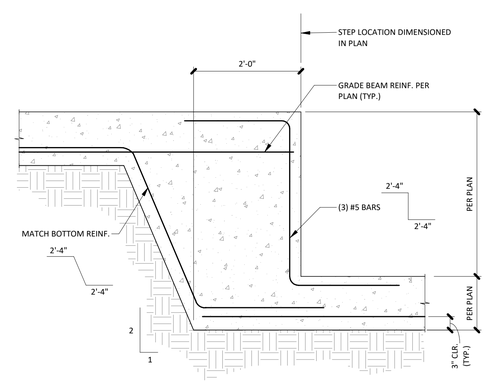
6. LAP CLASS B SHALL BE USED FOR ALL CASES UNLESS APPROVED BY E.O.R

7. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE BARS.

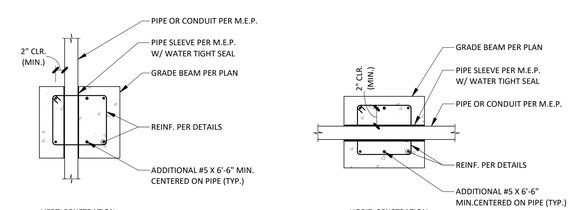
8.) LENGTHS SHOWN ARE FOR UNCOATED BARS. LENGTHS SHOWN SHALL BE MULTIPLIED BY 1.2 FOR ALL EXPOXY COATED BARS (ACI 318 SECTION 12.2.4)

9.) WHEN BARS OF DIFFERENT SIZES ARE LAP SPLICED, THE SPLICE LENGTH FOR THE LARGER BAR SHALL BE USED.

LAP SPLICE LENGTHS f'c=4000 psi | 11
1/2" = 1'-0" | S3.1



TYP. SHALLOW FOOTING STEP DETAIL | 12
3/4" = 1'-0" | S3.1



NOTE:

1.) CENTER BAR IN GRADE BEAM ALLOWED TO BE MOVED TO PROVIDE 2" CLEAR BY PIPING. ADD #5 ON OPPOSITE SIDE OF PIPING EXTENDING 3'-0" EACH SIDE OF PIPE.

2.) COORDINATE LOCATION OF PIPING WITH M.E.P. ACCEPTABLE TO TURN PIPE IN THE MIDDLE THIRD OF GRADE BEAM AND EXIT THROUGH THE SIDE OF THE GRADE BEAM. ADDITIONAL #5 BAR SHOWN ONLY REQUIRED WHEN PIPING PASSES THROUGH TOP OR BOTTOM OF GRADE BEAM.

TYPICAL GRADE BEAM PENETRATION DETAILS | 13
3/4" = 1'-0" | S3.1

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As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
03/30/2023

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com

BSE STRUCTURAL ENGINEERS
11320 West 79th Street
Lenexa, Kansas 66214
Phone 913.492.7400
www.BSEstructural.com
Project Number 22-365

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date 08.12.22
drawn by Author
checked by Checker
revisions
09.12.22
12.23.22

PDP permit

STATE OF MISSOURI
KEVIN S. BOHRINGER
NUMBER E-29757
12/23/22
PROFESSIONAL ENGINEER

sheet number
S3.1
TYPICAL FOUNDATION DETAILS
drawing type
project number

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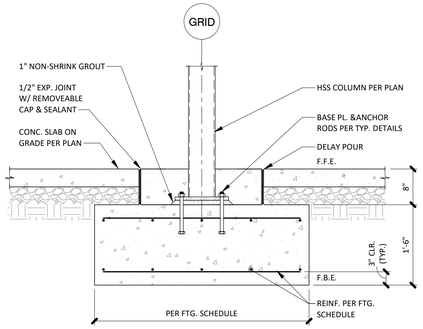
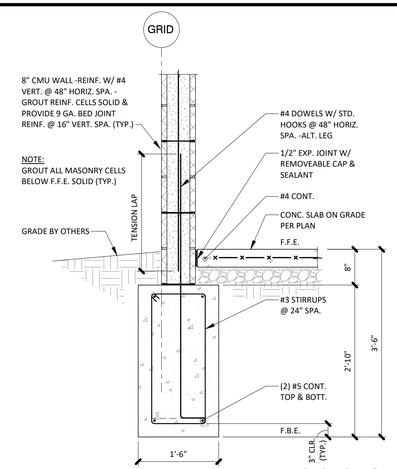
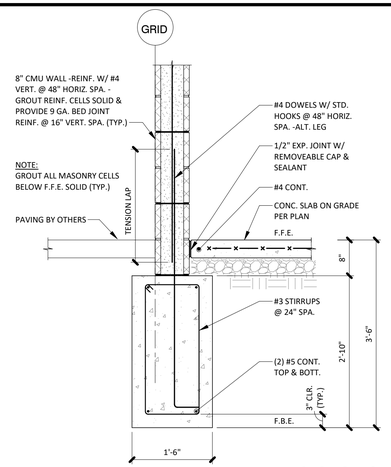


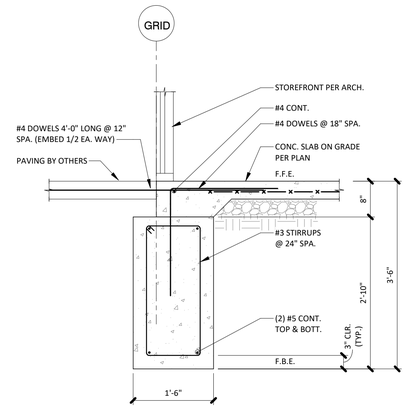
SECTION 01
3/4" = 1'-0" S3.2



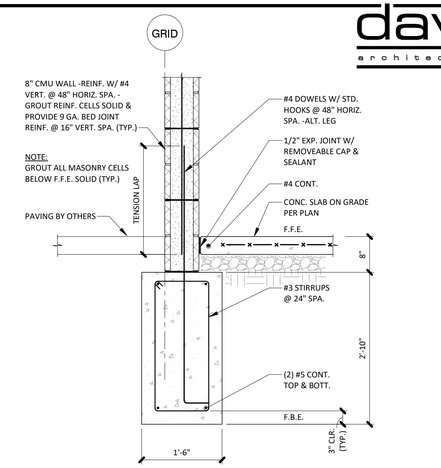
SECTION 02
3/4" = 1'-0" S3.2



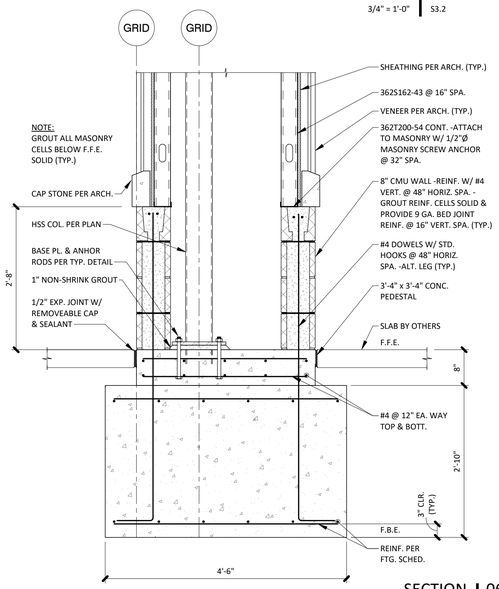
SECTION 03
3/4" = 1'-0" S3.2



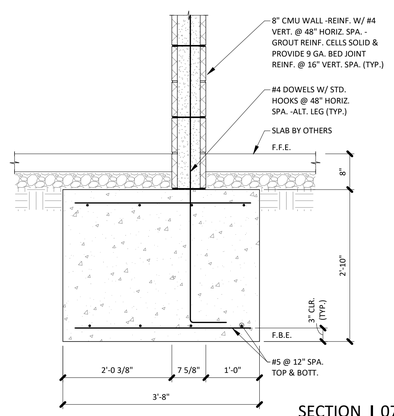
SECTION 04
3/4" = 1'-0" S3.2



SECTION 05
3/4" = 1'-0" S3.2



SECTION 06
3/4" = 1'-0" S3.2



SECTION 07
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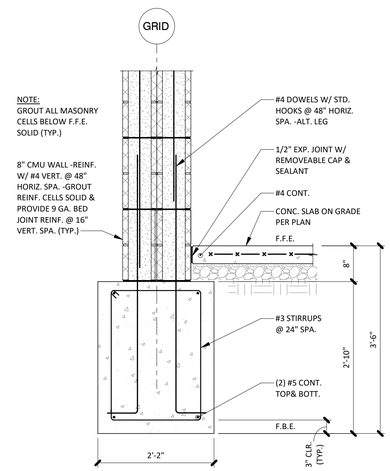
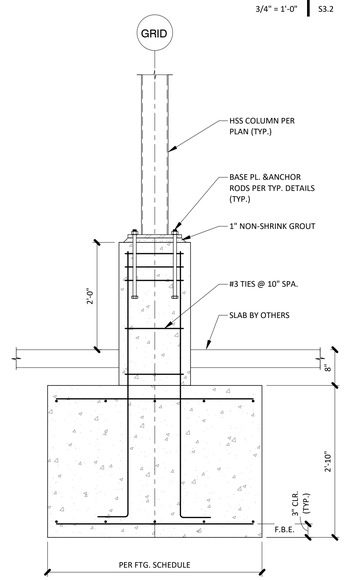
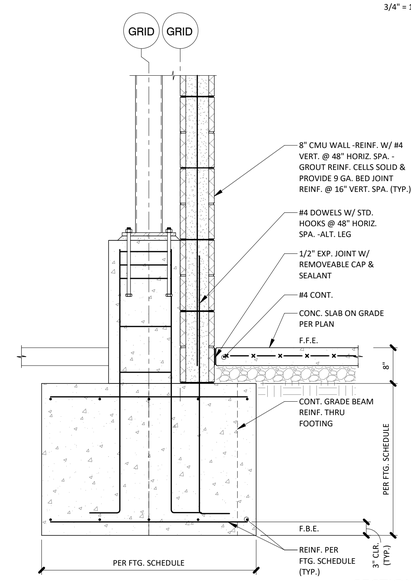
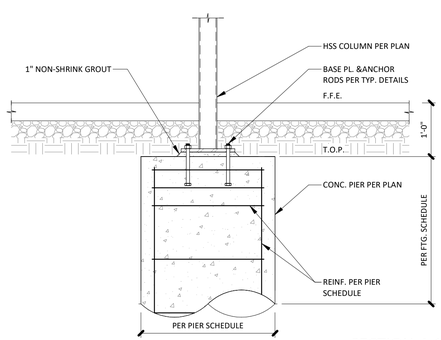


SECTION 08
3/4" = 1'-0" S3.2

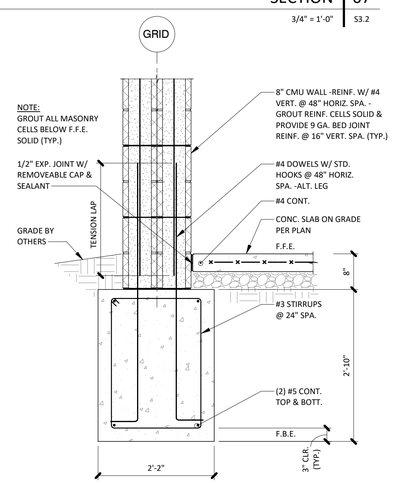




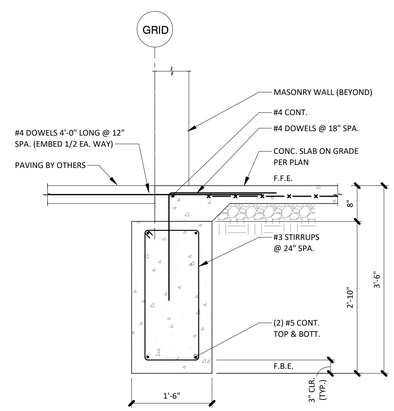
SECTION 09
3/4" = 1'-0" S3.2



SECTION 10
3/4" = 1'-0" S3.2



SECTION 11
3/4" = 1'-0" S3.2



SECTION 12
3/4" = 1'-0" S3.2

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.22
drawn by
SB
checked by
KB
revisions
09.12.22 PDP
12.23.22 permit

STATE OF MISSOURI
KEVIN S. BOERRINGER
NUMBER E-29757
12/23/22
PROFESSIONAL ENGINEER

sheet number
S3.2
FOUNDATION DETAILS

drawing type
project number

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As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
03/30/2023

davidson
architecture&engineering
4301 Indian Creek Parkway
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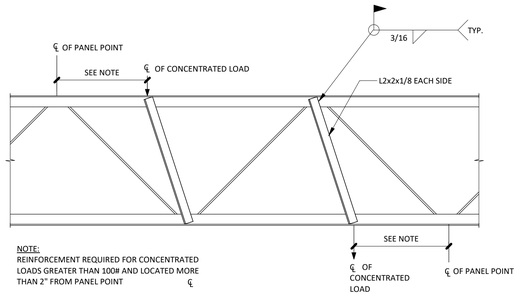
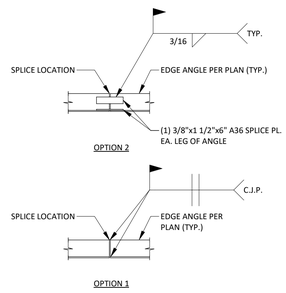
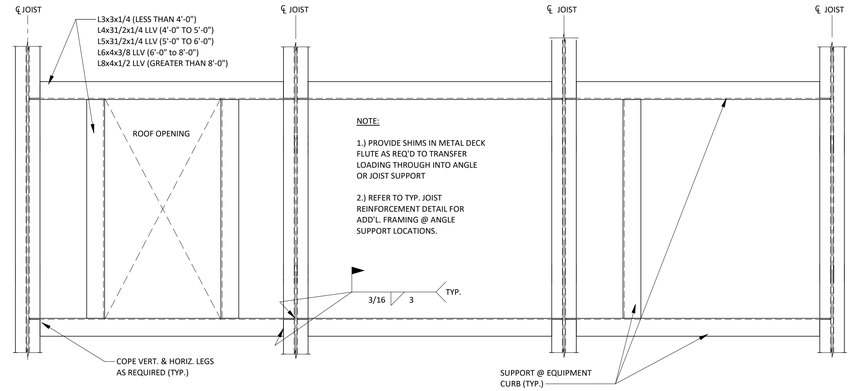


NOTE:
REINFORCEMENT REQUIRED FOR CONCENTRATED LOADS GREATER THAN 100# AND LOCATED MORE THAN 2" FROM PANEL POINT

TYP. JOIST REINFORCEMENT DETAIL | 01
3/4" = 1'-0" | S4.1



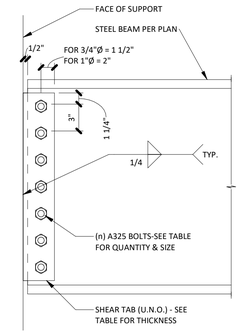
EDGE ANGLE SPLICE DETAIL | 02
3/4" = 1'-0" | S4.1



NOTE:
1.) PROVIDE SHIMS IN METAL DECK FLUTE AS REQ'D TO TRANSFER LOADING THROUGH INTO ANGLE OR JOIST SUPPORT

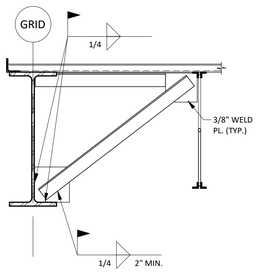
2.) REFER TO TYP. JOIST REINFORCEMENT DETAIL FOR ADD'L. FRAMING @ ANGLE SUPPORT LOCATIONS.

TYP. ROOF OPENING & EQUIP. SUPPORT FRAMING DETAIL | 03
3/4" = 1'-0" | S4.1

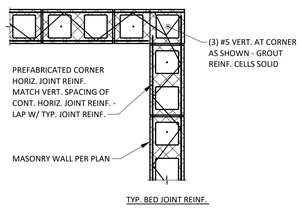


BEAM DEPTH	# OF (n) A325 BOLTS	BOLT Ø	SHEAR TAB THICKNESS
12"	3	3/4"	3/8"
14"	3	3/4"	3/8"
16"	4	3/4"	3/8"
18"	5	3/4"	3/8"
21"	6	1"	7/16"
24"	7	1"	7/16"
27"	8	1"	7/16"
30"	9	1"	7/16"
34"	10	1"	7/16"
36"	11	1"	7/16"

TYP. SHEAR TAB CONNECTION DETAIL | 04
1 1/2" = 1'-0" | S4.1



TYP. BEAM BOTTOM FLANGE BRACE DETAIL - JOIST | 05
3/4" = 1'-0" | S4.1



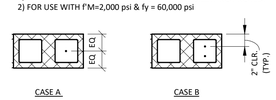
TYP. BED JOINT REINF.

CORNER HORIZ. JOINT REINF. | 06
3/4" = 1'-0" | S4.1

TYPICAL SPLICE LENGTHS FOR MASONRY BLOCK - STRENGTH DESIGN													
BLOCK WIDTH	CASE A - BARS CENTERED						CASE B - (2) BARS						
	VERTICAL BAR SIZE						VERTICAL BAR SIZE						
	#3	#4	#5	#6	#7	#8	#9	#3	#4	#5	#6	#7	#8	#9
6" BLOCK	14"	18"	28"	53"	-	-	-	-	-	-	-	-	-	-
8" BLOCK	14"	18"	22"	38"	52"	72"	*	15"	25"	39"	54"	63"	-	-
10" BLOCK	14"	18"	22"	35"	40"	61"	*	15"	25"	39"	54"	63"	72"	*
12" BLOCK	14"	18"	22"	35"	40"	61"	*	14"	22"	35"	54"	63"	72"	*

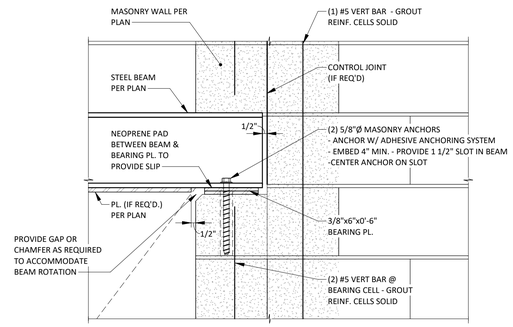
SYMBOLS:
- REINFORCING CONFIGURATION NOT PERMISSIBLE
* MECHANICAL TENSION SPLICE REQ'D

NOTES:
1) MECH. TENSION SPLICE CAN BE FOR ANY BAR SIZE IF NOT NOTED.
2) FOR USE WITH f'M=2,000 psi & fy = 60,000 psi

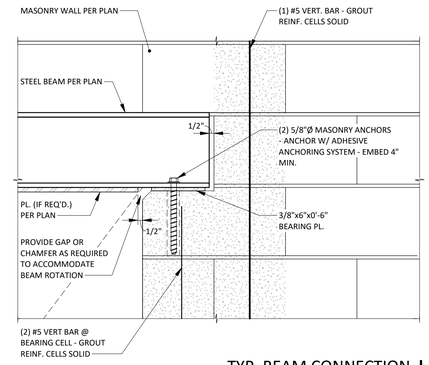


CASE A CASE B

MASONRY SPLICE TABLE | 07
3/4" = 1'-0" | S4.1

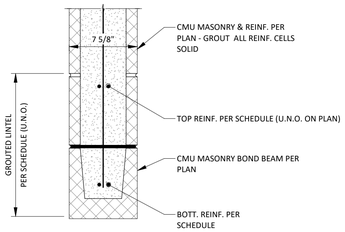


TYP. BEAM CONNECTION @ CONTROL JOINT | 08
1 1/2" = 1'-0" | S4.1



TYP. BEAM CONNECTION | 09
1 1/2" = 1'-0" | S4.1

BOND BEAM SCHEDULE				
MAX. SPAN	GROUTED BOND BEAM DEPTH	BOTT. REINF.	TOP REINF.	# OF BRG. CELLS
3'-4"	24"	(1) #4	(1) #4	1
9'-4"	24"	(1) #4	(1) #4	1



NOTE:
1.) FOR OPENING WIDTHS EXCEEDING WIDTHS SHOWN & NOT SHOWN ELSE WHERE ON DRAWINGS, CONTACT E.O.R. PRIOR TO CONSTRUCTION.

2.) BOND BEAM SIZES & REINFORCEMENT SHOWN IN PROJECT SPECIFIC DETAILS GOVERN OVER TYP. DETAILS.

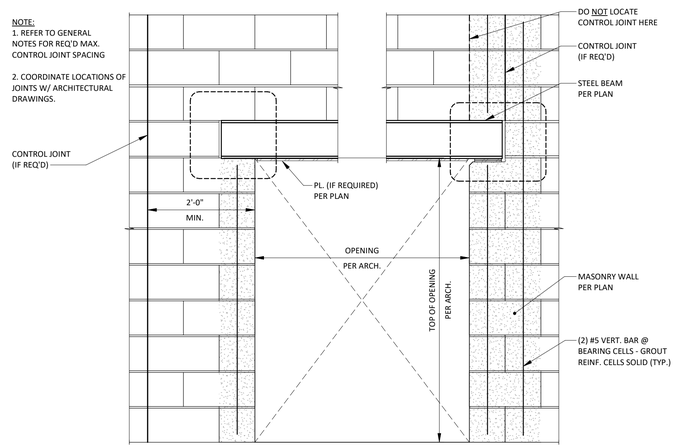
3.) EXTEND ALL BARS AND GROUTING BEYOND JAMBS PER TYP. DETAILS

4.) REFER TO TYP. DETAILS FOR ADD'L. INFORMATION.

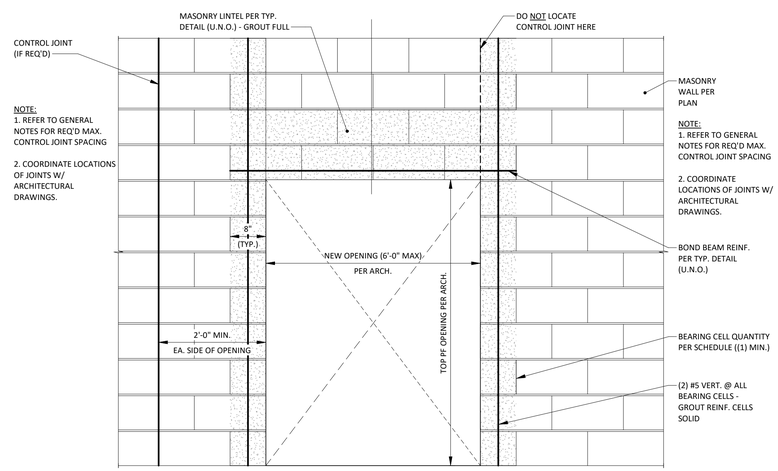
TYP. BOND BEAM DETAIL | 10
1 1/2" = 1'-0" | S4.1

NOTE:
1. REFER TO GENERAL NOTES FOR REQ'D MAX. CONTROL JOINT SPACING

2. COORDINATE LOCATIONS OF JOINTS W/ ARCHITECTURAL DRAWINGS.



TYP. MASONRY LINTEL DETAIL - STEEL BEAM | 11
3/4" = 1'-0" | S4.1



NOTE:
1. REFER TO GENERAL NOTES FOR REQ'D MAX. CONTROL JOINT SPACING

2. COORDINATE LOCATIONS OF JOINTS W/ ARCHITECTURAL DRAWINGS.

TYP. MASONRY WALL LINTEL DETAIL - BOND BEAM | 12
3/4" = 1'-0" | S4.1

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.22
drawn by
Author
checked by
Checker
revisions
09.12.22 PDP
12.23.22 permit

STATE OF MISSOURI
KEVIN S. BOEHRINGER
NUMBER E-29757
PROFESSIONAL ENGINEER
12/23/22

sheet number
S4.1
TYPICAL FRAMING DETAILS
drawing type
project number

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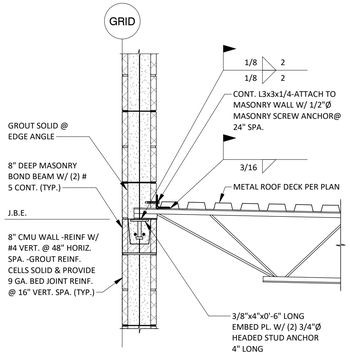
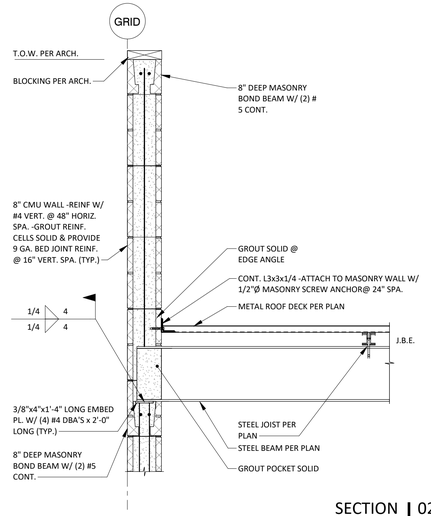
RELEASED FOR CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
03/30/2023

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com

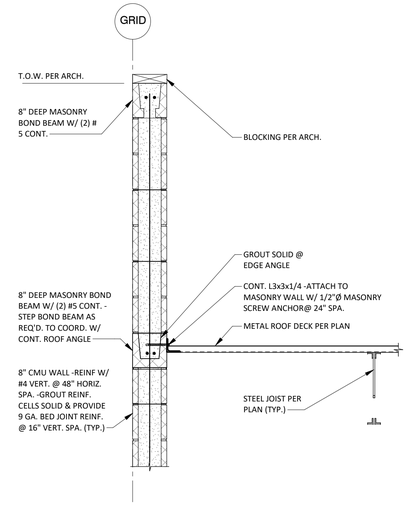
BSE STRUCTURAL ENGINEERS
11320 West 79th Street
Lenexa, Kansas 66214
Phone 913.492.7400
www.BSEstructural.com
Project Number 22-365



SECTION 01
3/4" = 1'-0" S4.2



SECTION 02
3/4" = 1'-0" S4.2



SECTION 03
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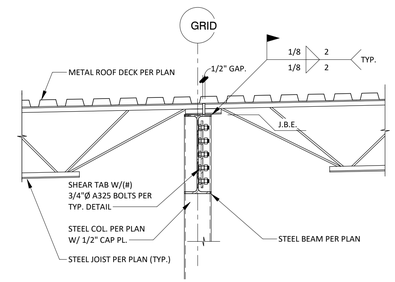
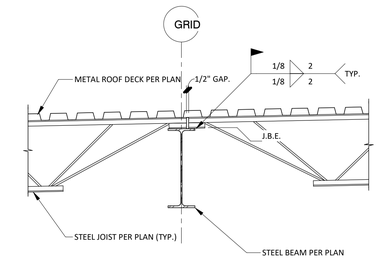
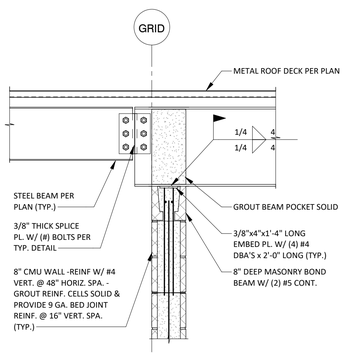


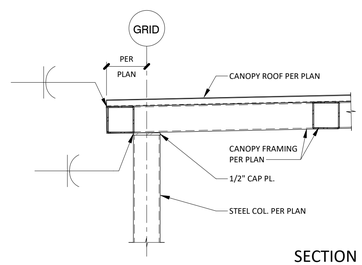
SECTION 04
3/4" = 1'-0" S4.2



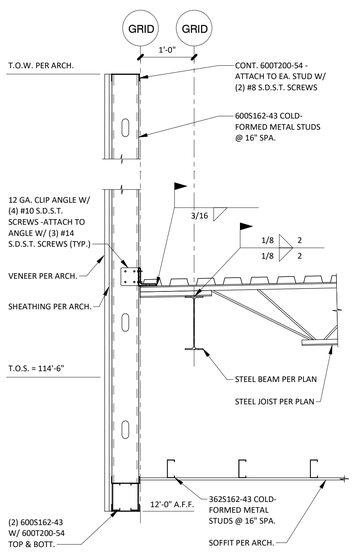
SECTION 05
3/4" = 1'-0" S4.2



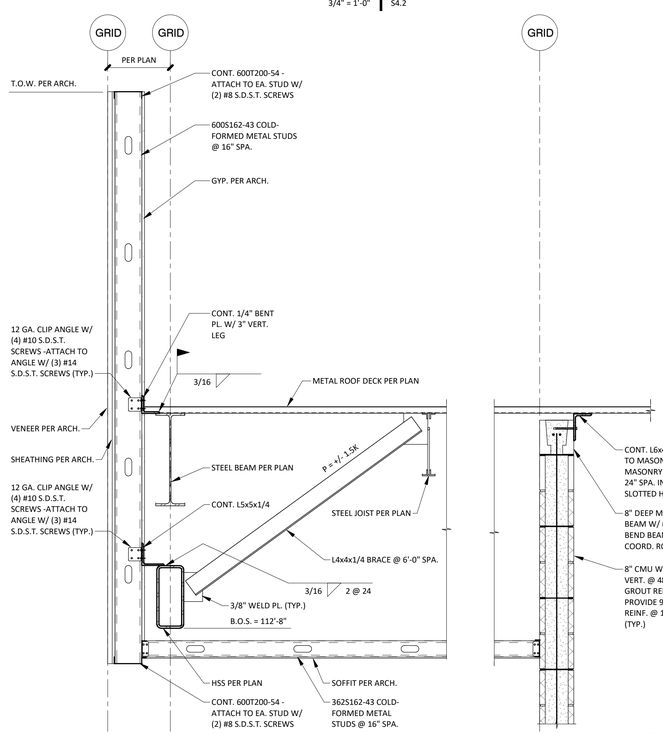
SECTION 06
3/4" = 1'-0" S4.2



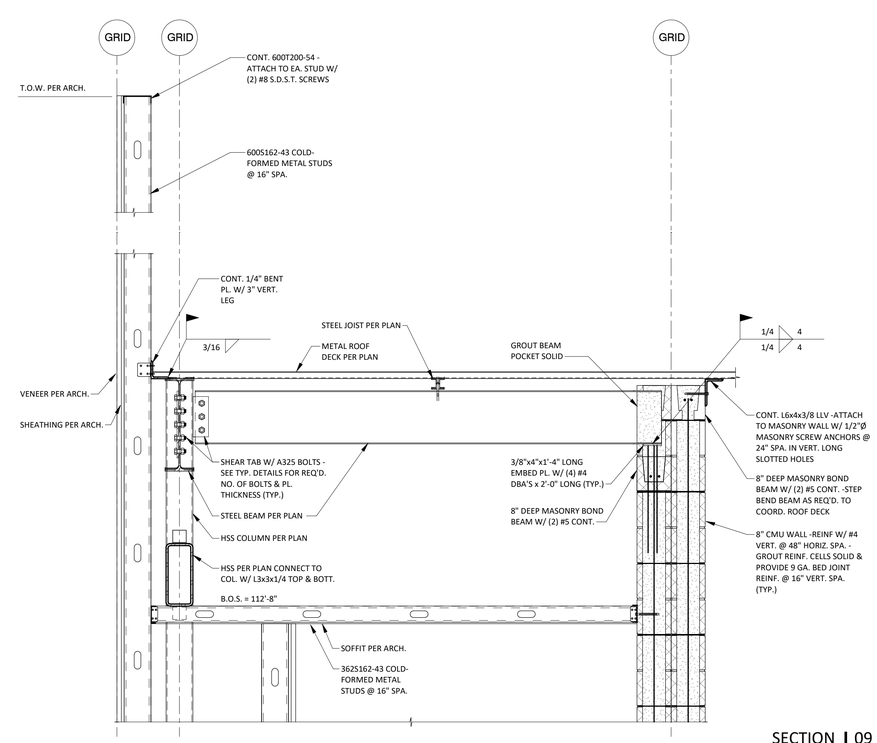
SECTION 11
3/4" = 1'-0" S4.2



SECTION 07
3/4" = 1'-0" S4.2



SECTION 08
3/4" = 1'-0" S4.2



SECTION 09
3/4" = 1'-0" S4.2

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
08.12.22
drawn by
Author
checked by
Checker
revisions
09.12.22
12.23.22

PDP
permit

STATE OF MISSOURI
KEVIN S. BOEHRINGER
NUMBER E-29757
PROFESSIONAL ENGINEER
12/23/22

sheet number
S4.2
FRAMING DETAILS

drawing type
project number

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MECHANICAL SPECIFICATIONS

1. GENERAL PROVISIONS:

A. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, NECESSARY FOR THE COMPLETE INSTALLATION OF THE PLUMBING AND MECHANICAL SYSTEMS OUTLINED.

B. OBTAIN ALL PERMITS, FEES, LICENSES, INSPECTIONS, AND CERTIFICATES OF COMPLIANCE OR APPROVAL AS REQUIRED BY THE AUTHORITIES.

C. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS OF THE GOVERNMENTAL BODIES HAVING JURISDICTION OVER THE SITE.

D. ALL TESTING REQUIRED BY AUTHORITIES SHALL BE CONSIDERED PART OF THIS WORK.

E. DURING CONSTRUCTION, ALL FIXTURES, EQUIPMENT, PIPE, DUCT, ETC. SHALL BE COVERED, PLUGGED, OR CAPPED AS REQUIRED TO KEEP CLEAN AND UNDAMAGED. ALL DAMAGED ITEMS SHALL BE RESTORED TO ORIGINAL CONDITION OR REPLACED. ALL PROTECTIVE COVERING SHALL BE REMOVED BEFORE FINAL ACCEPTANCE.

F. PROVIDE ALL NECESSARY CUTTING AND PATCHING OF WALLS, FLOORS, CEILINGS, AND ROOFS AS NECESSARY. PATCH AROUND ALL OPENINGS SHALL MATCH ADJACENT AREA. COORDINATE ALL ROOFING WORK WITH OWNER OR RESPONSIBLE PARTY, SO THAT THE EXISTING ROOFING WARRANTY WILL BE MAINTAINED.

G. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS AGAINST DEFECTS FOR A PERIOD OF ONE YEAR FROM FINAL ACCEPTANCE.

2. OPERATION AND MAINTENANCE MANUALS:

A. DURING THE COURSE OF CONSTRUCTION, COLLECT AND COMPILE OPERATING INSTRUCTIONS, WIRING DIAGRAMS, CATALOG CUTS, LUBRICATION AND PREVENTIVE MAINTENANCE INSTRUCTIONS, PARTS LISTS, ETC. FOR ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT.

B. ALL LITERATURE AND INSTRUCTIONS SHIPPED WITH THE EQUIPMENT SHALL BE SAVED FOR INCLUSION IN THE OPERATION AND MAINTENANCE MANUALS.

C. ALL LITERATURE LISTED ABOVE AND ALL PAPERS LISTING WARRANTIES, ETC. SHALL BE BOUND IN A 3-RING BINDER AND LABELED WITH THE PROJECT NAME, ADDRESS, ARCHITECT, ENGINEER, CONTRACTORS, ETC.

3. MANUFACTURERS:

A. MANUFACTURERS, MODEL NUMBERS, ETC. INDICATED OR SCHEDULED ON THE DRAWINGS SHALL BE INTERPRETED AS HAVING ESTABLISHED A STANDARD OF QUALITY AND SHALL NOT BE CONSTRUED AS LIMITING COMPETITION. ARTICLES, FIXTURES, ETC. OF EQUAL QUALITY BY MANUFACTURERS SHALL BE ACCEPTABLE, SUBJECT TO STRUCTURAL AND ELECTRICAL CONSTRAINTS OF THE PROJECT DESIGN, UNLESS NOTED OTHERWISE.

4. MOTORS:

A. PROVIDE THERMAL OVERLOAD PROTECTION FOR EACH MOTOR PROVIDED BY THIS WORK.

5. TESTING, BALANCING, AND CLEANING:

A. ALL PIPING SHALL BE TESTED FOR LEAKS BEFORE BEING CONCEALED IN WALL CONSTRUCTION OR COVERED WITH INSULATION.

B. SEWER AND VENT PIPING SHALL BE HYDROSTATICALLY TESTED WITH NO LESS THAN 10 FEET OF HEAD FOR A PERIOD OF NOT LESS THAN 15 MINUTES, PER THE LOCAL PLUMBING CODE, WITH NO LEAKS.

C. FIRE PROTECTION PIPING SHALL BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF NFPA.

D. DOMESTIC WATER PIPING SHALL BE HYDROSTATICALLY TESTED AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 60 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS, WITH NO LEAKS.

E. NATURAL GAS PIPING SHALL BE PNEUMATICALLY TESTED AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 50 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS, WITH NO LEAKS.

F. DUCTWORK AND PIPING SHALL BE BALANCED BY QUALIFIED INDEPENDENT BALANCING PERSONNEL WHO HAVE PREVIOUS EXPERIENCE WITH BALANCING PROCEDURES AND ARE CERTIFIED BY THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).

1) BALANCING SHALL INCLUDE THE BALANCING OF THE EQUIPMENT AND AIR DISTRIBUTION SYSTEMS TO PROVIDE DESIGN QUANTITIES INDICATED AND VERIFICATION OF PERFORMANCE OF ALL EQUIPMENT AND AUTOMATIC CONTROLS.

2) WITH IN 30 DAYS OF THE COMPLETION OF THE TESTING AND BALANCING WORK, SUBMIT THE TEST AND BALANCING REPORT BEARING THE SIGNATURE OF THE TEST AND BALANCE ENGINEER. THE REPORTS SHALL BE CERTIFIED PROOF THAT THE SYSTEMS HAVE BEEN TESTED, ADJUSTED, AND BALANCED IN ACCORDANCE WITH THE REFERENCED STANDARDS; ARE AN ACCURATE REPRESENTATION OF HOW THE SYSTEMS HAVE BEEN INSTALLED AND ARE OPERATING. REPORTS SHALL BE BOUND IN A VINYL BINDER AND THE BINDER LABELED OR MAY BE AN ELECTRONIC PDF SUBMITTAL.

G. BEFORE DOMESTIC WATER PIPING IS PLACED IN SERVICE, ALL DOMESTIC WATER DISTRIBUTION SYSTEMS, INCLUDING THOSE FOR COLD WATER AND HOT WATER SYSTEMS, SHALL BE FLUSHED, STERILIZED AND CHLORINATED IN ACCORDANCE WITH HEALTH DEPARTMENT REGULATIONS. THE SYSTEMS SHALL BE THOROUGHLY FLUSHED OF ALL DIRT AND FOREIGN MATTER, THEN FILLED WITH WATER TREATED WITH 50 PPM OF CHLORINE. DURING THE FILLING PROCESS, VALVES AND FAUCETS SHALL BE OPENED SEVERAL TIMES TO ASSURE TREATMENT OF THE ENTIRE SYSTEM. THE TREATED WATER SHALL BE LEFT IN THE SYSTEM FOR 24 HOURS AFTER WHICH TIME THE SYSTEM SHALL BE FLUSHED; IF THE RESIDUAL CHLORINE IS NOT LESS THAN 10 PPM, THE FLUSHING SHALL BE REPEATED. AFTER STERILIZATION, SAMPLES OF WATER IN THE SYSTEM SHALL BE APPROVED BY THE BOARD OF HEALTH.

6. PLUMBING:

A. PROVIDE AN APPROVED WATER HAMMER ARRESTOR FOR EACH PLUMBING FIXTURE SUPPLY AS REQUIRED BY FIXTURE MANUFACTURER.

B. ALL EXPOSED WASTE PIPE SHALL BE CHROME PLATED BRASS PIPE, NO FERROUS PIPE.

C. PROVIDE CLEANOUTS AT EACH CHANGE OF DIRECTION AND AT 100 FOOT INTERVALS IN STRAIGHT RUNS.

D. PROVIDE ACCESS PANELS FOR ALL CONCEALED VALVES AND TRAPS.

E. CLEANOUTS:

1) VINYL TILE FLOOR: JR SMITH #4140, OR EQUAL.
2) QUARRY TILE FLOOR: JR SMITH #4200, OR EQUAL.
3) CARPETED FLOOR: JR SMITH #4020-Y, OR EQUAL.
4) UNFINISHED FLOOR: JR SMITH #4020, OR EQUAL.
5) WALL: JR SMITH #4472, OR EQUAL, 24" ABOVE THE FLOOR.
6) GRADE: JR SMITH #4256, OR EQUAL, WITH HEAVY DUTY CAST IRON BODY AND COVER.

F. PROVIDE DIELECTRIC UNIONS WITH APPROPRIATE END CONNECTIONS TO MATCH THE PIPE SYSTEM IN WHICH INSTALLED (SCREWED, SOLDERED, OR FLANGED). PROVIDE DIELECTRIC UNIONS ON ALL PIPING CONNECTIONS TO HOT WATER HEATERS AND EXPANSION TANKS.

G. WATER HEATERS:

1) EVERY WATER HEATER SHALL HAVE AN APPROVED MEANS INSTALLED ON THE COLD WATER SUPPLY LINE ABOVE THE EQUIPMENT TO PREVENT SIPHONING OF A STORAGE WATER HEATER OR TANK.
2) BOTTOM FED WATER HEATERS AND TANKS CONNECT TO WATER HEATERS SHALL HAVE A VACCUM RELIEF VALVE INSTALLED. ANSI Z21.22.
3) STORAGE HEATERS OPERATING ABOVE ATMOSPHERIC PRESSURE SHALL HAVE AN APPROVED PRESSURE RELIEF VALVE AND/OR TEMPERATURE RELIEF VALVE.

H. ALL SEWER PIPING LOCATED INSIDE THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.

1) INSTALL 2-1/2" AND SMALLER PIPE AT 1/4" PER FOOT FALL.
2) INSTALL 3" AND LARGER PIPE AT 1/8" PER FOOT FALL.

I. ALL SEWER PIPING LOCATED EXTERIOR TO THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.

1) INSTALL 4" AND SMALLER PIPE AT A MINIMUM OF 2% SLOPE.

2) INSTALL 6" AND LARGER PIPE AT A MINIMUM OF 1% SLOPE.

7. PIPING:

A. DOMESTIC COLD AND HOT WATER (ABOVEGROUND).

1) TYPE L HARD DRAWN COPPER TUBING, ASTM B-88.
   a) WROUGHT COPPER SOLDERED FITTINGS, ASTM B75 ALLOY C12200. ANSI B16.22. MSS SP-104.
   b) MECHANICAL PRESS COPPER FITTINGS FOR USE IN PLUMBING OR MECHANICAL APPLICATIONS. ASME B16.22, ASME B16.51, or ASME B16.18. MECHANICAL PRESS COPPER FITTINGS SHALL CONFORM TO IAPMO PS-117 OR ASME B16.51.

2) PEX, HIGH-DENSITY CROSS-LINKED POLYETHYLENE TUBING SHALL BE MANUFACTURED TO THE REQUIREMENTS OF ASTM F876 AND MEET THE STANDARD GRADE HYDROSTATIC PRESSURE RATINGS FROM PLASTIC PIPE INSTITUTE IN ACCORDANCE WITH TR-4/03.

   a) PEX-A AND PEX-B MEETING ANSI/NSF61 AND ANSI/NSF372 STANDARDS FOR POTABLE WATER SAFETY AND LEAD-FREE STANDARDS AND MUST BE MARKED WITH "PW-G", "NSF-61-G" OR OTHER NSF-APPROVED MARKING. ASTM F2023 FOR USE WITH CHLORINATED WATER.

   b) PEX MECHANICAL, CRIMP/INSERT OR EXPANSION FITTINGS INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. PIPE SIZES GIVEN ON THE DRAWINGS ARE NOMINAL COPPER PIPE SIZE, INCREASE PEX PIPING SIZE TO EQUAL OR EXCEED COPPER PIPE INSIDE DIAMETER FOR SUPPLY MAINS.

3) VALVES
   a) TO BE INSTALLED ON THE FIXTURE SUPPLY TO EACH PLUMBING FIXTURE.
   b) TO BE INSTALLED ON THE WATER SUPPLY SIDE TO EACH APPLIANCE OR MECHANICAL EQUIPMENT.
   c) TYPES:
      1. GATE VALVE: JOMAR T/S-301G OR EQUAL. LEAD-FREE NSF 61, ANSI B1.20.1.
      2. GLOBE VALVE: JOMAR TGG OR EQUAL.
      3. BALL VALVE: JOMAR JP100PxP OR EQUAL COMPACT LEAD FREE BRASS BALL VALVE. UL842, CSA 3371-12 & 3371-92, FM, CALIFORNIA CODE AB1953, NSF61 ANNEX G APPROVED.
      4. BALL VALVE: JOMAR T-100NE OR EQUAL. UL842, FM, CSA, NSF 61-8, MSS SP-110

B. DOMESTIC WATER SERVICE, 1"-3"

1) TYPE K SOFT DRAWN COPPER TUBING, ASTM B-88.
   a) Cast Copper Alloy Fittings for Flared Copper Tube, ASME/ANSI B16.26:

2) HDPE, PIGMENTED BLUE THROUGHOUT, CTS SIZES 1"-2" AWWA C901 4710 DR9 PC250
IPS SIZES 2"-3", AWWA C901 4710 DR11 PC200
MATERIAL AND INSTALLATION MUST CONFORM TO WATER DEPARTMENT REQUIREMENTS.

C. WATER (FIRE) SERVICE, 3" OR LARGER.

1) DUCTILE IRON PIPE & FITTINGS, AWWA C151, CLASS 50, CEMENT LINING, SEALCOATED, AWWA C104. THRUST BLOCKS IN ACCORDANCE WITH NFPA 24.

2) HDPE IPS SIZES PIGMENTED BLUE THROUGHOUT, 3" AWWA C901 4710 DR11 PC200
4" AND LARGER AWWA C906 3408/4710 DR13.5 PC160
   a) STIFFENERS MUST BE USED IN THE ENDS OF THE HDPE, APPROVED TRACE WIRE MUST BE USED. # 12 AWG COPPERHEAD REINFORCED TRACE WIRE (BLUE IN COLOR)
   b) MATERIAL AND INSTALLATION MUST CONFORM TO WATER DEPARTMENT REQUIREMENTS.

3) POLYVINYL CHLORIDE (PVC) PIPE; AWWA C900; CLASS 200; WITH BELL END AND ELASTOMERIC GASKET, WITH PLAIN END FOR CAST-IRON OR DUCTILE-IRON FITTINGS, OR PVC ELASTOMERIC GASKET FITTINGS.

   a) PVC COUPLINGS AND FITTINGS: AWWA C900, WITH ASTM F 477 ELASTOMERIC SEAL GASKETS, ASTM F 477, ELASTOMERIC SEAL.

   b) DUCTILE-IRON AND CAST-IRON FITTINGS: AWWA C110, DUCTILE-IRON OR CAST-IRON, 250-PSI PRESSURE RATING; OR AWWA C153, DUCTILE-IRON COMPACT FITTINGS, 350-PSI PRESSURE RATING; OF DIMENSION TO MATCH PIPE OUTSIDE DIAMETER. AWWA C104, CEMENT MORTAR LINING; GASKETS PER AWWA C111, RUBBER.

4) THRUST BLOCKS IN ACCORDANCE WITH NFPA 24.

MECHANICAL SPECIFICATIONS (CONTINUED)

D. LEAD CONTENT OF WATER SUPPLY PIPE AND FITTINGS:

1) PIPE AND PIPE FITTINGS, INCLUDING VALVES AND FAUCETS, UTILIZED IN THE WATER SUPPLY SYSTEM SHALL NOT HAVE MORE THAN 8% LEAD CONTENT.

2) PIPE, PIPE FITTINGS, JOINTS, VALVES, FAUCETS, AND FIXTURE FITTINGS UTILIZED TO SUPPLY WATER FOR DRINKING OR COOKING PURPOSES SHALL COMPLY WITH NSF 372 AND SHALL HAVE A WEIGHTED AVERAGE LEAD CONTENT OF 0.25% OR LESS.

E. SANITARY SEWER AND VENTS.
(UNDERGROUND, INTERIOR TO THE BUILDING).

1) ABS PIPE AND FITTINGS: ABS PIPE AND FITTINGS SHALL COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEMS COMPONENTS AND RELATED MATERIALS," FOR PLASTIC PIPING COMPONENTS. INCLUDE MARKING WITH "NSF-DWV" FOR PLASTIC DRAIN, WASTE, AND VENT PIPING AND "NSF-SEWER" FOR PLASTIC SEWER PIPING. SOLID-WALL ABS PIPE: ASTM D 2661, SCHEDULE 40. ABS SOCKET FITTINGS: ASTM D 2661, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS. SOLVENT CEMENT: ASTM D 2235.

2) PVC PIPE AND FITTINGS: PVC PIPE AND FITTINGS SHALL COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEMS COMPONENTS AND RELATED MATERIALS," FOR PLASTIC PIPING COMPONENTS. INCLUDE MARKING WITH "NSF-DWV" FOR PLASTIC DRAIN, WASTE, AND VENT PIPING AND "NSF-SEWER" FOR PLASTIC SEWER PIPING. SOLID-WALL PVC PIPE: ASTM D 2665, DRAIN, WASTE, AND VENT. PVC SOCKET FITTINGS: ASTM D 2665, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS AND TO FIT SCHEDULE 40 PIPE. ADHESIVE PRIMER: ASTM F 656. SOLVENT CEMENT: ASTM D 2564.

3) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL.

4) HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.

F. SANITARY SEWER AND VENTS.
(ABOVE GROUND, INTERIOR TO THE BUILDING).

1) ABS PIPE AND FITTINGS: ABS PIPE AND FITTINGS SHALL COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEMS COMPONENTS AND RELATED MATERIALS," FOR PLASTIC PIPING COMPONENTS. INCLUDE MARKING WITH "NSF-DWV" FOR PLASTIC DRAIN, WASTE, AND VENT PIPING AND "NSF-SEWER" FOR PLASTIC SEWER PIPING. SOLID-WALL ABS PIPE: ASTM D 2661, SCHEDULE 40. CELLULAR-CORE ABS PIPE: ASTM F 628, SCHEDULE 40.ABS SOCKET FITTINGS: ASTM D 2661, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS. SOLVENT CEMENT: ASTM D 2235.

2) PVC PIPE AND FITTINGS: PVC PIPE AND FITTINGS SHALL COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEMS COMPONENTS AND RELATED MATERIALS," FOR PLASTIC PIPING COMPONENTS. INCLUDE MARKING WITH "NSF-DWV" FOR PLASTIC DRAIN, WASTE, AND VENT PIPING AND "NSF-SEWER" FOR PLASTIC SEWER PIPING. SOLID-WALL PVC PIPE: ASTM D 2665, DRAIN, CELLULAR-CORE PVC PIPE: ASTM F 891, SCHEDULE 40. WASTE, AND VENT. PVC SOCKET FITTINGS: ASTM D 2665, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS AND TO FIT SCHEDULE 40 PIPE. ADHESIVE PRIMER: ASTM F 656. SOLVENT CEMENT: ASTM D 2564.

3) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL.

4) HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.

G. SANITARY SEWER AND VENTS.
(UNDERGROUND, EXTERIOR TO THE BUILDING).

1) ABS PIPE AND FITTINGS: ABS PIPE AND FITTINGS SHALL COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEMS COMPONENTS AND RELATED MATERIALS," FOR PLASTIC PIPING COMPONENTS. INCLUDE MARKING WITH "NSF-DWV" FOR PLASTIC DRAIN, WASTE, AND VENT PIPING AND "NSF-SEWER" FOR PLASTIC SEWER PIPING. SOLID-WALL ABS PIPE: ASTM D 2661, SCHEDULE 40. ABS SOCKET FITTINGS: ASTM D 2661, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS. SOLVENT CEMENT: ASTM D 2235.

2) PVC PIPE AND FITTINGS: PVC PIPE AND FITTINGS SHALL COMPLY WITH NSF 14, "PLASTICS PIPING SYSTEMS COMPONENTS AND RELATED MATERIALS," FOR PLASTIC PIPING COMPONENTS. INCLUDE MARKING WITH "NSF-DWV" FOR PLASTIC DRAIN, WASTE, AND VENT PIPING AND "NSF-SEWER" FOR PLASTIC SEWER PIPING. SOLID-WALL PVC PIPE: ASTM D 2665, DRAIN, WASTE, AND VENT. PVC SOCKET FITTINGS: ASTM D 2665, MADE TO ASTM D 3311, DRAIN, WASTE, AND VENT PATTERNS AND TO FIT SCHEDULE 40 PIPE. ADHESIVE PRIMER: ASTM F 656. SOLVENT CEMENT: ASTM D 2564.

3) HUBLESS CAST IRON SOIL PIPE AND FITTINGS: HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. HUBLESS COUPLINGS SHALL CONFORM TO CISPI STANDARD 310 AND BE CERTIFIED BY NSF® INTERNATIONAL.

4) HUB AND SPIGOT CAST IRON SOIL PIPE AND FITTINGS: HUB AND SPIGOT CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 74.

5) COPPER DWV: DRAINAGE TUBE SHALL CONFORM TO ASTM B306, WROUGHT COPPER FITTINGS, ANSI B-16.29.

6) GALVANIZED STEEL PIPE, WITH MALLEABLE IRON, THREADED FITTINGS, DRAINAGE PATTERN FOR SEWERS SHALL CONFORM TO ASTM A 53.

H. CONDENSATE DRAINS & INDIRECT WASTE (ABOVEGROUND).
1) POLYVINYLCHLORIDE (PVC) DWV PIPE, SCHEDULE 40, SOLVENT JOINT (CONDENSATE ON ROOF).
2) DWV, WROUGHT COPPER, ANSI B-16.29 (WATER HEATER T&P).

I. NATURAL GAS.

1) BLACK STEEL PIPE, SCHEDULE 40, ASTM A53.
   a) PIPE 3" AND SMALLER; 150 LB. MALLEABLE IRON, THREADED FITTINGS.
   b) PIPE 4" AND SMALLER; VIEGA MEGAPRESS G FOR WATER AND GAS. CSA LC4, TSSA/ASME B31 FOR USE WITH ASTM A53 SCHEDULE 40 BLACK IRON PIPE.
   c) PIPE 2-1/2" AND LARGER, WELDED.
   d) PLUG VALVE: ROCKWELL NORDSTROM FIGURE NO. 142 OR 143.
   e) BALL VALVE: JOMAR T-100NE. APPROVALS- UL842, FM, CSA, NSF 61-8, MSS SP-110

2) GAS PIPING LABELING:
   a) ALL ELEVATED PRESSURE GAS PIPING SHALL BE LABELED EVERY 40 FEET WITH SIGNS INDICATING "ELEVATED PRESSURE".

3) GAS PIPING PAINTING:
   a) ALL BLACK STEEL GAS PIPING LOCATED EXTERIOR TO THE BUILDING SHALL BE PRIMED AND PAINTED TO EITHER MATCH ADJACENT EXTERIOR WHERE LOCATED ON OR NEAR EXTERIOR WALL AND PAINTED SAFETY YELLOW WHERE LOCATED ON THE ROOF.

J. ALL PIPE HANGERS AND SUPPORTS SHALL BE STANDARD PRODUCTS OF GRINNELL, FEE AND MASON, OR ELCEN. HANGER SPACING SHALL BE IN ACCORDANCE WITH MSS-SP-69.

K. SLEEVES

1) PROVIDE, SET, AND PROPERLY LOCATE PIPE SLEEVES AS REQUIRED FOR THIS WORK. ALL SLEEVES SHALL BE OF SUFFICIENT SIZE TO PERMIT PIPE MOVEMENT DUE TO EXPANSION AND CONTRACTION AND TO ACCOMMODATE PIPE INSULATION.

2) INTERIOR PARTITIONS: 16 GAGE GALVANIZED STEEL, PACK BETWEEN PIPE AND SLEEVE WITH FIRE SAFING AND CAULK AT EACH END WITH FIRE RESISTANT SEALANT.

3) ROOF: PROSET OR EQUAL, MANUFACTURED PVC SCHEDULE 40 PIPE SLEEVE WITH WATERPROOF SEAL. COORDINATE WITH ROOFING CONTRACTOR AND FLASH AS REQUIRED TO MAINTAIN ROOF WARRANTY.

4) PROTECTION AGAINST CONTACT: METALLIC PIPING, EXCEPT FOR CAST IRON, DUCTILE IRON AND GALVANIZED STEEL SHALL NOT BE PLACED IN DIRECT CONTACT WITH STEEL FRAMING MEMBERS, CONCRETE, OR CINDER WALLS AND FLOORS OR OTHER MASONRY. METALLIC PIPING SHALL NOT BE PLACED IN DIRECT CONTACT WITH CORROSIVE SOIL. SHEATHING USED TO PREVENT DIRECT CONTACT SHALL HAVE A THICKNESS OF GREATER THAN .008: AND THE SHEATHING SHALL BE MADE OF PLASTIC. ANY PIPE THAT PASSES THROUGH A FOUNDATION WALL OR FOOTING SHALL BE PROVIDED WITH A RELIEVING ARCH, OR A PIPE SLEEVE SHALL BE BUILT INTO THE FOUNDATION WALL. THE SLEEVE SHALL BE TWO SIZES GREATER THAN THE PIPE PASSING THOUGH THE WALL OR FOOTING.

5) PLUMBING VENTS: FLASH ROOF VENT INTO ROOFING SYSTEM AS REQUIRED BY THE ROOFING CONTRACTOR TO MAINTAIN EXISTING ROOF WARRANTY. ALL PLUMBING VENT TERMINALS SHALL TERMINATE A MINIMUM OF 12" ABOVE ROOF OR EQUAL TO HEIGHT OF PARAPET, WHICHEVER IS GREATER.

L. PROVIDE CHROME PLATED ESCUTCHEONS ON ALL PIPE ENTERING FINISHED AREAS.

8. WATER HEATERS

A. COMMERCIAL, LIGHT-DUTY, STORAGE, ELECTRIC, DOMESTIC-WATER HEATERS:
1. STANDARD: UL 174
2. STORAGE-TANK CONSTRUCTION: STEEL, VERTICAL ARRANGEMENT.
   a. PRESSURE RATING: 150 PSIG.
   b. INTERIOR FINISH: COMPLY WITH NSF 61 AND NSF 372 BARRIER MATERIALS FOR POTABLE-WATER TANK LININGS, INCLUDING EXTENDING LINING MATERIAL INTO TAPPINGS.
3. FACTORY-INSTALLED, STORAGE-TANK APPURTENANCES:
   a. ANODE ROD: REPLACEABLE MAGNESIUM.
   b. DIP TUBE: REQUIRED UNLESS COLD-WATER INLET IS NEAR BOTTOM OF TANK.
   c. DRAIN VALVE: CORROSION-RESISTANT METAL WITH HOSE-END CONNECTION.
   d. INSULATION: COMPLY WITH ASHRAE/IES 90.1
   e. JACKET: STEEL WITH ENAMELED FINISH OR HIGH-IMPACT COMPOSITE MATERIAL.
   f. HEAT-TRAP FITTINGS: INLET TYPE IN COLD-WATER INLET AND OUTLET TYPE IN HOT-WATER OUTLET.
   g. HEATING ELEMENTS: ELECTRIC, SCREW-IN IMMERSION TYPE.
   h. TEMPERATURE CONTROL: ADJUSTABLE THERMOSTAT.
   i. SAFETY CONTROL: HIGH-TEMPERATURE-LIMIT CUTOFF DEVICE OR SYSTEM.
   j. RELIEF VALVE: ASME RATED AND STAMPED FOR COMBINATION TEMPERATURE-AND-PRESSURE RELIEF VALVES. INCLUDE RELIEVING CAPACITY AT LEAST AS GREAT AS HEAT INPUT, AND INCLUDE PRESSURE SETTING LESS THAN WORKING-PRESSURE RATING OF DOMESTIC-WATER HEATER. SELECT RELIEF VALVE WITH SENSING ELEMENT THAT EXTENDS INTO STORAGE TANK.

B. DOMESTIC-WATER EXPANSION TANKS:
1. DESCRIPTION: STEEL, PRESSURE-RATED TANK CONSTRUCTED WITH WELDED JOINTS AND FACTORY-INSTALLED, BUTYL-RUBBER DIAPHRAGM. INCLUDE AIR PRECHARGE TO MINIMUM SYSTEM-OPERATING PRESSURE AT TANK.
2. CONSTRUCTION:
   a. TAPPINGS: FACTORY-FABRICATED STEEL, WELDED TO TANK BEFORE TESTING AND LABELING. INCLUDE ASME B1.20.1 PIPE THREAD.
   b. INTERIOR FINISH: COMPLY WITH NSF 61 AND NSF 372 BARRIER MATERIALS FOR POTABLE-WATER TANK LININGS, INCLUDING EXTENDING FINISH INTO AND THROUGH TANK FITTINGS AND OUTLETS.
   c. AIR-CHARGING VALVE: FACTORY INSTALLED.
3. CAPACITY AND CHARACTERISTICS:
   a. WORKING-PRESSURE RATING: 150 PSIG .

9. FIRE PROTECTION (WET PIPE SPRINKLER SYSTEM):

A. PROVIDE A "WET-PIPE" SPRINKLER SYSTEM WITH AUTOMATIC SPRINKLERS AND CONNECTED TO A SUFFICIENT WATER SUPPLY.

B. THE SYSTEM DESIGN SHALL BE BASED ON ORDINARY HAZARD GROUP 2 CLASSIFICATION, NFPA 13.

C. THE WET PIPE SPRINKLER SYSTEM SHALL CONFORM TO ALL REQUIREMENTS OF THE OWNER'S INSURANCE CARRIER AND LOCAL AUTHORITIES. PROVIDE SYSTEM DRAWINGS WITH A PROFESSIONAL ENGINEERS STAMP ON THE DRAWINGS FOR REVIEW BY THE OWNER'S INSURANCE CARRIER AND LOCAL AUTHORITIES PRIOR TO INSTALLATION OF PIPING.

MECHANICAL SPECIFICATIONS (CONTINUED)

D. THE WET PIPE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY DESIGNED, BASED ON A WATER FLOW DATA OBTAINED FROM THE LOCAL WATER OR FIRE DEPARTMENT.

E. PIPE AND TUBING MATERIALS:

1) STEEL PIPE, SMALLER THAN 2".
   a) ASTM A 53/A 53M STANDARD, SCHEDULE 40, SEAMLESS, BLACK STEEL PIPE.
   b) ASTM A 135;L ASTM A 795/A 795M; OR ASME B36.10M, WALL THICKNESS GREATER THAN OR EQUAL TO SCHEDULE 30 AND LESS THAN SCHEDULE 40, BLACK STEEL PIPE.
   c) ASTM A 135 OR ASTM 795/A 795M, THREADABLE, WALL THICKNESS LESS THAN SCHEDULE 30 AND GREATER THAN SCHEDULE 10, BLACK-STEEL PIPE.
   d) ASTM A 135 OR ASTM A 795/A 795M SCHEDULE 5 STEEL PIPE.

2) STEEL PIPE, 2" AND LARGER: ASTM A 795, SCHEDULE 10, SEAMLESS, BLACK STEEL.

F. FITTINGS:

1) CAST-IRON THREADED FITTINGS: ANSI B16.4, CLASS 125, STANDARD PATTERN, FOR THREADED JOINTS. THREADS SHALL CONFORM TO ANSI B1.20.1.

2) MALLEABLE-IRON THREADED FITTINGS: ANSI B16.3, CLASS 150, STANDARD PATTERN, FOR THREADED JOINTS. THREADS SHALL CONFORM TO ANSI B1.20.1.

3) STEEL FITTINGS: ASTM A 234, SEAMLESS OR WELDED, FOR WELDED JOINTS.

4) GROOVED MECHANICAL FITTINGS: ASTM A 536, GRADE 65-45-12 DUCTILE IRON; ASTM A 47 GRADE 32510 MALLEABLE IRON; OR ASTM A53, TYPE F, E, OR S; GRADE B FABRICATED STEEL FITTINGS WITH GROOVES OR SHOULDERS DESIGNED TO ACCEPT GROOVED END COUPLINGS, IN ACCORDANCE WITH ITS LISTING.

G. HANGERS AND SUPPORTS:

1) HANGERS, ANCHORS, AND SUPPORTS FOR FIRE PROTECTION PIPING AND EQUIPMENT SHALL BE IN ACCORDANCE WITH NFPA 13. HANGERS, ANCHORS, SUPPORTS, AND COMPONENTS SHALL BE LISTED BY UL AND ANY OTHER AGENCIES REQUIRED BY THE LOCAL FIRE AUTHORITIES AND THE OWNER'S INSURANCE CARRIER.

H. AUTOMATIC SPRINKLERS:

1) SPRINKLER HEADS: TYPE AS INDICATED OR REQUIRED BY THE APPLICATION. UNLESS OTHERWISE REQUIRED, PROVIDE HEADS WITH NOMINAL 1/2 INCH DISCHARGE ORIFICE, FOR "ORDINARY" TEMPERATURE RANGE.

2) SPRINKLER HEADS SHALL BE OF THE FOLLOWING CONSTRUCTION, CONFIGURATIONS, AND FINISH FOR THE AREAS INDICATED:

   a) FINISHED AREAS; SEMI-RECESSED PENDANT, CHROME PLATED, CHROME ESCUTCHEON CUP.

   b) UNFINISHED AREAS; UPRIGHT, ROUGH BRASS.

3) FURNISH THREE EXTRA SPRINKLER HEADS OF EACH TYPE INCLUDED IN THE PROJECT, AND PROVIDE A SPRINKLER HEAD CABINET AND ANY SPECIAL WRENCHES TO REMOVE OR INSTALL SPRINKLER HEADS.

4) FURNISH QUICKSTOP TALON SPRINKLER TOOL. QUICKSTOP TALON SHALL STOP ½" AND ¾" HEADS. THE TOOL SHALL FEATURE A FUSIBLE LINK TO RELEASE THE TOOL IF HEATED AND SHALL BE 100% WATER TIGHT UP TO 350 PSI.

I. ALARM DEVICES:

1) WATER FLOW INDICATORS: VANE TYPE WATERFLOW DETECTOR, RATED TO 250 PSIG; DESIGNED FOR HORIZONTAL OR VERTICAL INSTALLATION; HAVE 2-SPDT CIRCUIT SWITCHES TO PROVIDE ISOLATED ALARM AND AUXILIARY CONTACTS, 7 AMPERE 125 VOLTS AC AND 0.25 AMPERE 24 VOLTS DC; COMPLETE WITH FACTORY-SET, FIELD-ADJUSTABLE RETARD ELEMENT TO PREVENT FALSE SIGNALS, AND TAMPER-PROOF COVER WHICH SENDS A SIGNAL WHEN COVER IS REMOVED.

2) SUPERVISORY SWITCHES: SPST, NORMALLY CLOSED CONTACTS, DESIGNED TO SIGNAL VALVE IS IN OTHER THAN FULL OPEN POSITION.

10. INSULATION AND DUCT LINING:

A. ALL INSULATIONS AND ACCESSORIES SHALL HAVE A FIRE HAZARD CLASSIFICATION WITH A FLAME SPREAD RATING OF NOT OVER 25, A FUEL CONTRIBUTION RATING OF NOT OVER 50, AND A SMOKE DEVELOPED RATING OF NOT OVER 50, IN ACCORDANCE WITH NFPA.

B. PIPE INSULATION - ABOVE GRADE:

1) THE PIPING INSULATION USED SHALL HAVE A THERMAL CONDUCTIVITY OF 0.27 Btu PER in/hr*sqft*F° OR LESS.

2) FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER, ASJ JACKET, FACTORY APPLIED PRESSURE SEALING LONGITUDE LAP JOINT, NO STAPLES, ZESTON PREMOLDED PVC FITTING COVERS. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

3) FLEXIBLE CLOSED CELL ELASTOMERIC THERMAL INSULATION, UNSLIT OR PRESLIT WITH PRESSURE SENSITIVE ADHESIVE SYSTEM FOR CLOSURE AND VAPOR SEALING, EQUAL TO ARMSTRONG AP ARMAFLEX OR ARMAFLEX 2000.

4) FOR NON CIRCULATING SYSTEMS, THE FIRST 8 FEET OF INLET AND OUTLET PIPING BETWEEN THE TANK AND THE HEAT TRAP (INCLUDING THE HEAT TRAP) MUST BE INSULATED.

5) FOR CIRCULATING SYSTEMS, ALL HOT WATER PIPING IN THE CIRCULATION LOOP MUST BE INSULATED AS SPECIFIED BELOW.

6) INSULATION SCHEDULE:

a) DOMESTIC COLD WATER	1/2"
b) DOMESTIC HOT WATER	1" FOR PIPING UP TO 1-1/4"Φ, & 1-1/2" FOR PIPING 1-1/2"Φ AND LARGER
c) CONDENSATE DRAINS INSIDE BUILDING	1/2"

C. DUCTWORK: ACOUSTICAL INSULATION.

1) DUCT LINING: 2 LB/CF, THICKNESS AS SCHEDULED, AIR STREAM SIDE COATED, INSTALL PER SMACNA STANDARDS.

   a) DUCT LINING SCHEDULE:

(1) RECTANGULAR SUPPLY DUCT	1/2" : THROUGHOUT THE FIRST 10 FEET OF DUCT.
(2) RETURN AIR DUCT	1/2" : THROUGHOUT THE FIRST 10 FEET OF DUCT.

D. DUCTWORK: THERMAL INSULATION.

1) DUCT COVERING: 3/4 LB/CF, FIBERGLASS BLANKET WITH FACTORY APPLIED VAPOR BARRIER AND FACING, THICKNESS AS SCHEDULED, INSTALLATION IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.

   a) DUCT COVERING SCHEDULE: MINIMUM R-6

(1) ROUND SUPPLY DUCT	2"
(2) RECTANGULAR SUPPLY DUCT	2"
(3) RETURN AIR DUCT	2"

3) EXPOSED SPIRAL DUCT.

   a) DOUBLE WALL SPIRAL - DOUBLE WALL INSULATED SPIRAL DUCT AND FITTINGS WITH PERFORATED 1"LINER WITH A K VALUE OF 0.27.

   b) SPIRAL DUCT LINING: JOHNS MANVILLE SPIRACOUSTIC PLUS ROUND DUCT LINER SYSTEM, VSD, SD, AND LD SIZES, 8"Φ AND UP. MEETS ASTM E 84 25/50 FLAME AND SMOKE, ASHRAE 62, MEA#237-86-M, SMACNA APPLICATION STANDARDS FOR DUCT LINERS, NAIMA FIBERBLASS DUCT LINER STANDARD. 1" THICKNESS, AIR STREAM SIDE COATED, INSTALL PER SMACNA STANDARDS.

11. DUCTWORK:

A. ALL DUCTWORK, UNLESS OTHERWISE INDICATED, SHALL BE FABRICATED FROM GALVANIZED SHEET STEEL COMPLYING WITH ASTM A 527, LOCKFORMING QUALITY, WITH G 90 ZINC COATING IN ACCORDANCE WITH ASTM A 525; AND MILL PHOSPHATIZED FOR EXPOSED LOCATIONS.

B. WHERE DUCTWORK IS INDICATED TO BE EXPOSED TO VIEW IN OCCUPIED SPACES, PROVIDE MATERIALS WHICH ARE FREE FROM VISUAL IMPERFECTIONS INCLUDING PITTING, SEAM MARKS, ROLLER MARKS, STAINS AND DISCOLORATIONS, AND OTHER IMPERFECTIONS, INCLUDING THOSE WHICH WOULD IMPAIR PAINTING.

C. DUCTWORK, METAL GAUGES, REINFORCING, ETC. SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS," LATEST EDITION FOR A 2 INCH WATER GAUGE STATIC PRESSURE.

1) RECTANGULAR DUCT:

   a) ELBOWS, UNLESS INDICATED OTHERWISE SHALL BE CONSTRUCTED WITH CENTERLINE RADIUS OF NOT LESS THAN 1.5 DUCT WIDTH OR SQUARE ELBOW WITH DOUBLE WALL STREAMLINE VANES.

   b) RETURN AIR ACOUSTICAL ELBOWS AND SOUND BOOTS SHALL BE A SQUARE ELBOW WITH NO TURNING VANES.

   c) SLOPES FOR TRANSITIONS OR OTHER CHANGES IN DIMENSIONS SHALL BE MINIMUM 1 TO 3.

2) ROUND AND OVAL SPIRAL SEAM DUCT:

   a) PROVIDE RADIUS TYPE FITTINGS FABRICATED OF MULTIPLE SECTIONS WITH MAXIMUM 15 DEGREE CHANGE OF DIRECTION PER SECTION. UNLESS SPECIFICALLY DETAILED OTHERWISE, USE 45 DEGREE LATERALS FOR BRANCH TAKEOFF CONNECTIONS. WHERE 90 DEGREE BRANCHES ARE INDICATED PROVIDE CONICAL TYPE TEES.

   b) SLOPES FOR TRANSITIONS OR OTHER CHANGES IN DIMENSIONS SHALL BE MINIMUM 1 TO 3.

   c) AS AN OPTION, PROVIDE FACTORY-FABRICATED DUCT AND FITTINGS, IN LIEU OF SHOP-FABRICATED DUCT AND FITTINGS.

      (1) ELBOWS: ONE PIECE CONSTRUCTION FOR 90 DEGREES AND 45 DEGREE ELBOW 14" AND SMALLER. PROVIDE MULTIPLE GORE CONSTRUCTION FOR LARGER DIAMETERS WITH STANDING SEAM CIRCUMFERENTIAL JOINT.

      (2) DIVIDED FLOW FITTINGS: 90 DEGREE TEES, CONSTRUCTED WITH SADDLE TAP SPOT WELDED AND BONDED TO DUCT FITTING BODY.

   d) ROUND LONGITUDINAL SEAM DUCT. USE FOR RIGID METAL DUCT ON LEAVING SIDE OF DUCT IN CONCEALED LOCATIONS FOR EXTENSION TO FLEX FOR DIFFUSERS, UNLESS OTHERWISE INDICATED.

D. DUCT SIZES SHOWN ON THE DRAWINGS ARE SHEETMETAL SIZES, ALLOWANCE FOR DUCT LINER HAS BEEN MADE WHERE APPLICABLE.

E. INSTALLATION OF METAL DUCTWORK:

1) GENERAL: ASSEMBLE AND INSTALL DUCTWORK IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES WHICH WILL ACHIEVE AIR-TIGHT SYSTEMS (MAXIMUM 5% LEAKAGE), WITH NO OBJECTIONABLE NOISE, AND CAPABLE OF PERFORMING INDICATED SERVICE. INSTALL EACH RUN WITH MINIMUM NUMBER OF JOINTS. ALIGN DUCTWORK ACCURATELY WITH INTERNAL SURFACES SMOOTH. SUPPORT DUCTS RIGIDLY WITH SUITABLE STRAPS, BRACES, HANGERS AND ANCHORS IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS" LATEST EDITION. DUCT HANGERS SHALL BE OF THE TYPE WHICH WILL HOLD DUCTS TRUE-TO-SHAPE AND TO PREVENT BUCKLING. SUPPORT VERTICAL DUCTS AT EVERY FLOOR.

2) AUXILIARY STEEL: PROVIDE AUXILIARY STEEL AS REQUIRED TO ADEQUATELY SUPPORT DUCTWORK.

3) ROUTING: LOCATE DUCTWORK RUNS, EXCEPT AS OTHERWISE INDICATED, VERTICALLY AND HORIZONTALLY AND AVOID DIAGONAL RUNS WHEREVER POSSIBLE. LOCATE RUNS AS INDICATED BY DIAGRAMS, DETAILS AND NOTATIONS OR, IF NOT OTHERWISE INDICATED, RUN DUCTWORK IN SHORTEST ROUTE WHICH DOES NOT OBSTRUCT USABLE SPACE OR BLOCK ACCESS FOR SERVICING BUILDING AND ITS EQUIPMENT. HOLD DUCTS CLOSE TO WALLS, OVERHEAD CONSTRUCTION, COLUMNS, AND OTHER STRUCTURAL AND PERMANENT ENCLOSURE ELEMENTS OF BUILDING. WHEREVER POSSIBLE IN FINISHED AND OCCUPIED SPACES, CONCEAL DUCTWORK FROM VIEW, BY LOCATING IN MECHANICAL SHAFTS, HOLLOW WALL CONSTRUCTION OR ABOVE SUSPENDED CEILINGS. DO NOT ENCASE HORIZONTAL RUNS IN SOLID PARTITIONS, EXCEPT AS SPECIFICALLY SHOWN. COORDINATE LAYOUT WITH SUSPENDED CEILING AND LIGHTING LAYOUTS AND SIMILAR FINISHED WORK.

4) DO NOT ROUTE DUCTWORK THROUGH ELECTRICAL EQUIPMENT SPACES AND ENCLOSURES, UNLESS INDICATED OTHERWISE.

MECHANICAL SPECIFICATIONS (CONTINUED)

5) PENETRATIONS:

   a) WHERE DUCTS PASS THROUGH INTERIOR PARTITIONS OR EXTERIOR WALLS, AND ARE EXPOSED TO VIEW, CONCEAL SPACE BETWEEN OPENING AND DUCT OR DUCT INSULATION WITH SHEET METAL FLANGES OF SAME GAGE AS DUCT. OVERLAP OPENING ON 4 SIDES BY AT LEAST 1-1/2". FASTEN TO DUCT AND WALL.

   b) WHERE DUCTS PASS THROUGH FIRE-RATED FLOORS, WALLS, OR PARTITIONS, PROVIDE FIRESTOPPING BETWEEN DUCT AND WALL.

6) COORDINATION: COORDINATE DUCT INSTALLATIONS WITH INSTALLATION OF ACCESSORIES, DAMPERS, COIL FRAMES, EQUIPMENT, CONTROLS, AND OTHER ASSOCIATED WORK OF THE DUCTWORK SYSTEM.

7) INSTALLATION: INSTALL METAL DUCTWORK IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS", LATEST EDITION.

F. EQUIPMENT CONNECTIONS:

1) CONNECT METAL DUCTWORK TO EQUIPMENT AS INDICATED, PROVIDE FLEXIBLE CONNECTION FOR EACH DUCTWORK CONNECTION TO EQUIPMENT MOUNTED ON VIBRATION ISOLATORS, AND/OR EQUIPMENT CONTAINING ROTATING MACHINERY. PROVIDE ACCESS DOORS AS REQUIRED.

G. SEAL ALL CONCEALED DUCTWORK JOINTS WITH NON-HARDENING, NON-MIGRATING MASTIC SEALANT, AS RECOMMENDED FOR SEALING SEAMS AND JOINTS IN DUCTWORK. OIL BASE CAULKING AND GLAZING COMPOUNDS SHALL NOT BE ACCEPTABLE. DUCTS SHALL BE SEALED TO THE CLASS LEVEL LISTED BELOW.

1) UNCONDITIONED SPACES	CLASS B	CLASS A	CLASS C	CLASS B
2) CONDITIONED SPACES (PLENUM)	CLASS C	CLASS B	CLASS B	CLASS C
	SUPPLY ≤ 2" W.C.	SUPPLY > 2" W.C.	EXHAUST	RETURN

12. FLEXIBLE DUCT:

A. ATCO #086 (R-6), OR EQUAL.

B. FACTORY APPLIED INSULATION AND VAPOR BARRIER, 1-1/2" THICK.

C. MAXIMUM LENGTH OF 5'-0".

13. FLUES AND ACCESSORIES:

A. FLUES VENT SHALL BE OF DOUBLE-WALL, FACTORY-BUILT TYPE FOR USE ON PRESSURIZED VENTING SYSTEMS AS REQUIRED BY MANUFACTURER. FLUE VENT SHALL BE SAF-T VENT SC PLUS OT EQUAL MODEL, 4"-7" DIA. PROVIDE MANUFACTURER'S STANDARD FITTINGS AND ACCESSORIES (ROOF THIMBLE, STORM COLLAR, COUNTERFLASHING, ETC.) AS REQUIRED FOR A COMPLETE INSTALLATION. PROVIDE STRUCTURAL SUPPORT FOR FLUE. APPLIANCE SHALL NOT BEAR THE WEIGHT OF THE FLUE.

B. PROVIDE MANUFACTURER'S STANDARD ACCESSORY ITEMS INCLUDING BIRD PROOF TOP, STORM COLLAR, ROOF THIMBLE, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION. ROOF THIMBLES THROUGH THE BUILDING ROOF SHALL BE SUITABLE FOR USE WITH THE ROOF PROVIDED.

14. EXHAUST FANS:

A. CENTRIFUGAL TYPE FAN WITH CHARACTERISTICS AND CAPACITY AS SCHEDULED, ELECTRICALLY POWERED, SUITABLE FOR MOUNTING ON ROOF CURB, DIRECT OR BELT DRIVEN, HEAVY GAUGE SPUN-ALUMINUM WEATHERPROOF HOUSINGS OF THE HOODED DOME OR UPBLAST TYPE. PROVIDE PERMANENT SPLIT-CAPACITOR TYPE MOTOR FOR DIRECT DRIVEN FANS, AND CAPACITOR-START, INDUCTION-RUN TYPE MOTOR FOR BELT DRIVEN FANS.

B. CENTRIFUGAL CEILING EXHAUSTERS SHALL BE ELECTRICALLY POWERED CENTRIFUGAL TYPE FAN SUITABLE FOR MOUNTING IN THE CEILING WITH A PERFORATED OFF-WHITE METAL GRILLE WITH A THUMBSCREW ATTACHMENT FOR EASY ACCESS TO FAN HOUSING. UNIT SHALL CONSIST OF A GALVANIZED STEEL HOUSING LINED WITH ACOUSTICAL INSULATION AND SHALL INCLUDE AN INTEGRAL BACKDRAFT DAMPER ON FAN DISCHARGE. MOTOR SHALL BE A PERMANENT SPLIT-CAPACITOR TYPE MOTOR, PERMANENTLY LUBRICATED, WITH THERMAL OVERLOAD PROTECTION. PROVIDE DISCONNECT SWITCH OR OTHER MEANS OF DISCONNECT AT MOTOR IN FAN HOUSING.

15. ROOFTOP UNITS:

A. UNIT SHALL BE FACTORY-ASSEMBLED AND TESTED, DESIGNED FOR ROOF INSTALLATION, AND SHALL CONSIST OF SCROLL TYPE COMPRESSOR(S), CONDENSERS, EVAPORATOR COILS, THERMAL EXPANSION VALVE, CONDENSATE DRAIN PAN, CONDENSER AND EVAPORATOR FANS, CONDENSER FANS TO BE SEQUENCED. REFRIGERATION CONTROLS, GAS FIRED HEAT EXCHANGER OR ELECTRIC HEATING SECTION, FILTERS, AND DAMPERS. CAPACITIES AND ELECTRICAL CHARACTERISTICS SHALL BE AS SCHEDULED ON THE DRAWINGS.

B. COMPRESSOR(S): UNIT SHALL INCLUDE VIBRATION ISOLATORS AND CRANKCASE HEATER. REFRIGERANT CIRCUIT SHALL INCLUDE A FILTER DRYER, SIGHT GLASS, COMPRESSOR SERVICE VALVES, AND LIQUID LINE SERVICE VALVES.

C. SAFETY CONTROLS SHALL INCLUDE:

a) LOW PRESSURE CUTOUT, MANUAL RESET.
b) HIGH PRESSURE CUTOUT, MANUAL RESET.
c) COMPRESSOR MOTOR OVERLOAD PROTECTION, MANUAL RESET.
d) ANTI-RECYCLING TIMING DEVICE.
e) ADJUSTABLE LOW-AMBIENT LOCKOUT.
f) OIL PRESSURE SWITCH.

D. REFRIGERANT COIL: ALUMINUM FINS BONDED TO SEAMLESS COPPER TUBE BY MEANS OF MECHANICAL EXPANSION. AN EQUALIZING TYPE VERTICAL DISTRIBUTOR SHALL ENSURE EACH COIL CIRCUIT RECEIVES THE SAME AMOUNT OF REFRIGERANT.

E. ECONOMIZER SHALL CONSIST OF RETURN AIR DAMPER, OUTDOOR AIR DAMPER, AND BAROMETRIC RELIEF DAMPER. PROVIDE POWERED EXHAUST FAN WITH MANUFACTURER'S STANDARD CONTROLS FOR UNITS SCHEDULED ON THE DRAWINGS.

F. GAS HEAT: INDIRECT FIRED, GAS HEAT EXCHANGER, AUTOMATIC SPARK IGNITION, MANUFACTURER'S STANDARD GAS TRAIN WITH REGULATOR (IF REQUIRED), AGA APPROVED. VERIFY GAS SERVICE PRESSURE TO INDIVIDUAL ROOFTOP UNITS.

G. ROOFTOP UNITS SHALL BE WIRED TO SHUTDOWN ON A SIGNAL FROM THE SMOKE DETECTORS AND SHALL AUTOMATICALLY RESET WHEN THE SMOKE DETECTORS ARE RESET.

16. UNIT HEATERS:

A. UNIT HEATERS SHALL BE FACTORY ASSEMBLED, PRE-WIRED UNITS CONSISTING OF CASING, SUPPLY FAN, GAS FIRED HEAT EXCHANGER, AND CONTROLS.

B. MOTOR SHALL BE TOTALLY ENCLOSED, WITH BUILT-IN, AUTOMATIC THERMAL OVERLOAD PROTECTION. PROPELLER SHALL BE EQUIPPED WITH SAFETY FAN GUARD.

C. THE HEAT EXCHANGER SHALL BE ALUMINIZED STEEL CONSTRUCTION.

D. THE UNITS SHALL BE EQUIPPED WITH THE MANUFACTURER'S STANDARD CONTROLS INCLUDING 24 VOLT CONTROL TRANSFORMER, AUTOMATIC SPARK IGNITION, AUTOMATIC GAS VALVE WITH GAS TRAIN, SAFETY PILOT WITH 100% SHUTOFF, AND FAN TIMED DELAY RELAY.

E. UNIT HEATERS SHALL BE AGA APPROVED.

17. CONTROL WIRING:

A. ELECTRICAL WIRING AND WIRING CONNECTIONS REQUIRED FOR THE INSTALLATION OF THE TEMPERATURE CONTROL SYSTEM, SHALL BE PROVIDED BY THIS CONTRACTOR, UNLESS SPECIFICALLY SHOWN ON THE ELECTRICAL DRAWINGS OR SPECIFICATIONS.

B. INSTALL CONTROL WIRING, WITHOUT SPLICES BETWEEN TERMINAL POINTS, COLOR CODED. INSTALL IN NEAT WORKMANLIKE MANNER, SECURELY FASTENED. INSTALL IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE AND THE ELECTRICAL SPECIFICATIONS.

1) INSTALL CIRCUITS OVER 25 VOLT WITH COLOR CODED NUMBER 12 WIRE.

2) INSTALL CIRCUITS UNDER 25 VOLT WITH COLOR CODED NUMBER 18 WIRE WITH 0.031 INCH HIGH TEMPERATURE 105 DEGREES F PLASTIC INSULATION ON EACH CONDUCTOR AND PLASTIC SHEATH OVER ALL.

3) INSTALL ELECTRONIC CIRCUITS WITH COLOR CODED NUMBER 22 WIRE WITH 0.023 INCH POLYETHYLENE INSULATION ON EACH CONDUCTOR WITH PLASTIC JACKETED COPPER SHIELD OVER ALL.

4) INSTALL LOW VOLTAGE CIRCUITS, LOCATED IN CONCRETE SLABS AND MASONRY WALLS, OR EXPOSED IN OCCUPIED AREAS, IN ELECTRIC CONDUIT.

5) ALL WIRING IN AREAS USED AS AIR PLENUMS SHALL BE IN ELECTRIC CONDUIT EXCEPT THAT LOW VOLTAGE WIRING MAY BE TEFLON COATED, ALUMINUM SHEATHED CABLE OR OTHER WIRE SPECIFICALLY APPROVED FOR INSTALLATION IN AIR PLENUMS, WHERE ACCEPTABLE BY LOCAL CODES.

6) ALL WIRING IN AREAS NOT USED FOR AIR MOVEMENT SHALL BE IN ELECTRIC METALLIC TUBING EXCEPT LOW VOLTAGE WIRING MAY BE IN APPROVED SIGNAL CABLE WHERE ACCEPTED BY LOCAL CODES.

C. THERMOSTATIC CONTROLS TO HAVE A 5°F DEADBAND AND SETPOINT OVERLAP RESTRICTIONS.

1) TEMPERATURE CONTROLS SETBACK TO BE 55°F (HEAT) AND 85° (COOL), 2-HOUR OCCUPANT OVERRIDE, 10-HOUR BACKUP.

D. THERMOSTATIC CONTROLS TO HAVE A 5°F DEADBAND AND SETPOINT OVERLAP RESTRICTIONS.

CODE INFORMATION

2018 - INTERNATIONAL BUILDING CODE
2018 - INTERNATIONAL PLUMBING CODE
2018- INTERNATIONAL MECHANICAL CODE
2018 - INTERNATIONAL FUEL GAS CODE
2018 - INTERNATIONAL FIRE CODE
2017 - NATIONAL ELECTRICAL CODE
ICC/ANSI A117.1-2009, ACCESSIBLE & USABLE BUILDINGS & FACILITIES

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davidson
architecture&engineering

4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9390
fax: 913.451.9391
www.davidsonae.com

2/23/2023
BRIAN A. QUISSELL
NUMBER
PE-2004000829

a new store for
Westlake ACE Hardware
3511 SW Market Street
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date
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BC PROJECT #: 22784
MISSOURI PE COA #2009003629

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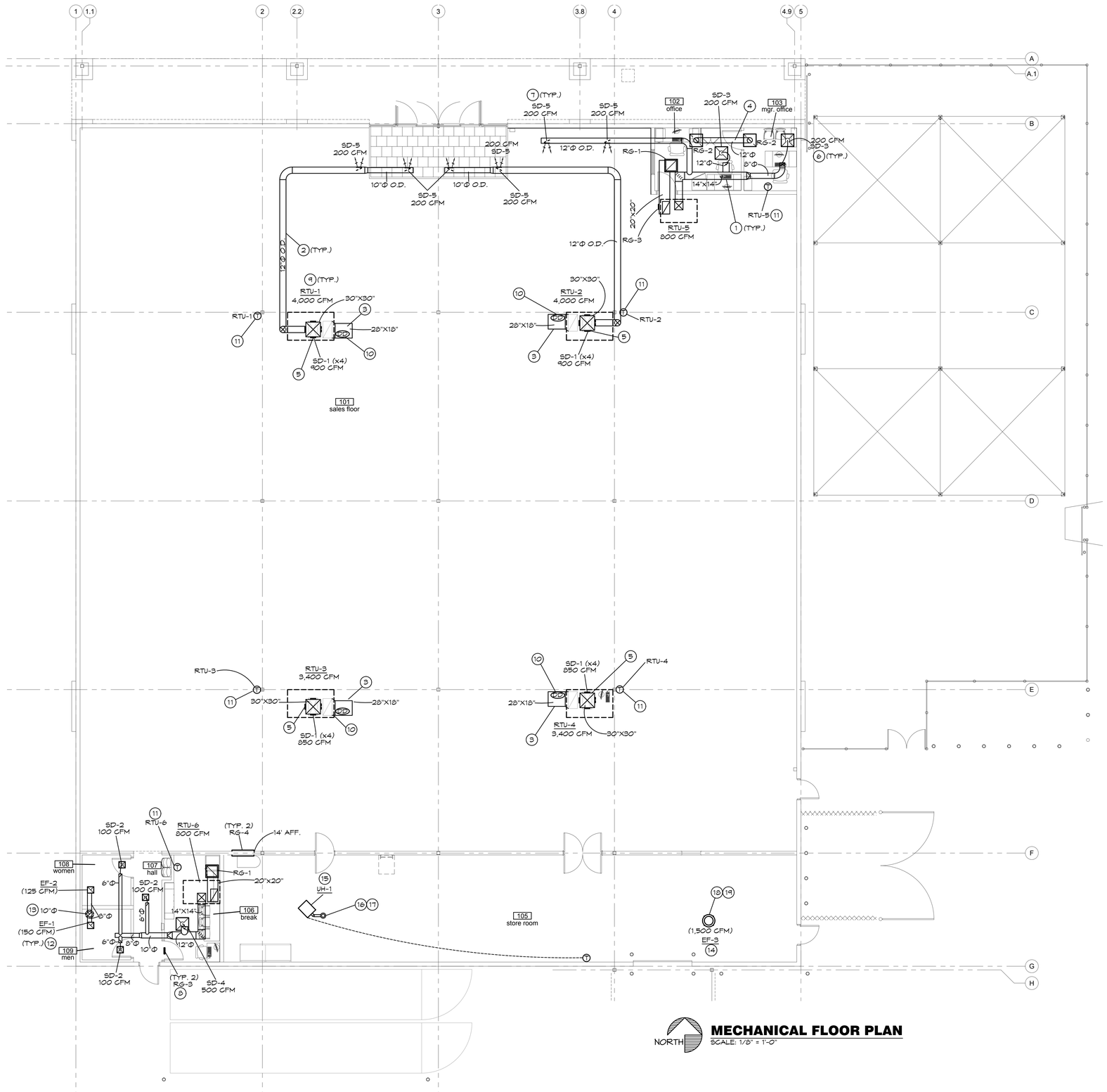

MECHANICAL FLOOR PLAN

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

NORTH

MECHANICAL GENERAL NOTES:

1. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACES AVAILABLE, AND WITHOUT INTERFERENCES.
2. THIS CONTRACTOR SHALL PERFORM ALL WORK INDICATED AND/OR AS REQUIRED FOR THE PROPER INSTALLATION AND OPERATION OF THE MECHANICAL SYSTEMS.
3. REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF DIFFUSERS.
4. INSTALL ALL DUCT, PIPE, ETC. AS HIGH AS POSSIBLE.
5. DUCT SIZES SHOWN ARE ACTUAL SHEET METAL SIZES AND INCLUDE AN ALLOWANCE FOR DUCT LINER WHERE APPLICABLE.
6. PROVIDE FLEXIBLE CONNECTION BETWEEN DUCTWORK AND ROOFTOP UNITS, EXHAUST FANS, AND OTHER MOTORIZED EQUIPMENT.
7. NO DUCT SHALL BE ROUTED OVER THE TOP OF ELECTRICAL PANELS.
8. ALL MECHANICAL SYSTEMS SHALL BE BALANCED BY A CERTIFIED BALANCING CONTRACTOR. REFER TO SPECIFICATIONS FOR DETAILS.

MECHANICAL PLAN NOTES:

1. PROVIDE CONCEALED SUPPLY AND RETURN DUCTWORK . ROUTE DUCTWORK UP HIGH AND SUPPORT TO THE STRUCTURE. ALL DUCTWORK SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS. COORDINATE INSTALLATION OF DUCTWORK WITH FIRE SPRINKLER PIPING.
2. INSTALL EXPOSED DOUBLE WALL ROUND SPIRAL SUPPLY DUCTWORK IN OPEN CEILING AREA. PROVIDE DUCT LINER IN EXPOSED ROUND SUPPLY AIR DUCTWORK. DUCT SIZES SHOWN ARE OUTER DIAMETER AND INCLUDE AN ALLOWANCE FOR DUCT LINER. COORDINATE INSTALLATION OF DUCTWORK WITH FIRE SPRINKLER PIPING.
3. OPEN RETURN AIR DUCT, COVER OPENING WITH $\frac{1}{4}$" X $\frac{1}{4}$" MESH SCREEN. INSTALL BOTTOM OF DUCT AT 15'-2".
4. PROVIDE RETURN SOUND BOOT PER DETAIL.
5. SUPPLY DIFFUSERS MOUNTED IN DUCT DROP BELOW TRUSS STRUCTURE. INSTALL BOTTOM OF DUCT AT 14'-0", BOTTOM OF DIFFUSERS AT 14'-3".
6. PROVIDE CEILING MOUNTED SUPPLY DIFFUSER AS DETAILED.
7. PROVIDE SPIRAL DUCT MOUNTED SUPPLY DIFFUSERS AS DETAILED.
8. PROVIDE RETURN AIR TRANSFER GRILLE ON EACH SIDE OF WALL ABOVE DOOR.
9. PROVIDE SINGLE PACKAGED ROOF TOP HVAC UNIT AS SHOWN ON THE PLAN. INSTALLATION OF EQUIPMENT SHALL COMPLY WITH EQUIPMENT MANUFACTURER'S INSTALLATION AND CLEARANCE REQUIREMENTS TO ALLOW FOR INSPECTION, SERVICE, REPAIR OR REPLACEMENT. FRESH AIR INTAKE OF ROOF TOP HVAC UNIT SHALL BE LOCATED A MINIMUM OF 10'-0" FROM VENT THRU, FLUES AND EXHAUST FANS.
10. LOCATION OF DUCT MOUNTED SMOKE DETECTOR. PROVIDE REMOTE ENUNCIATOR AUDIO/VISUAL. VERIFY LOCATION WITH FIRE MARSHAL PRIOR TO INSTALLATION. REFER TO SPEC SHEET MPO FOR ADDITIONAL INFORMATION.
11. PROVIDE 7 DAY PROGRAMMABLE THERMOSTAT WITH CONTROL FOR HEATING AND COOLING. MOUNT THERMOSTAT 48" ABOVE THE FINISHED FLOOR. PROVIDE LOCKING COVER FOR EACH OF THE THERMOSTAT.
12. PROVIDE CEILING MOUNTED EXHAUST FAN WITH INTEGRAL BACKDRAFT DAMPER. SUPPORT UNIT FROM STRUCTURE AS REQUIRED BY THE MANUFACTURER.
13. ROUTE 10"Φ EXHAUST DUCT UP TO WEATHER HEAD ON ROOF. ENSURE MIN. 10'-0" CLEARANCE FROM ALL OUTDOOR AIR INTAKES.
14. PROVIDE ROOF MOUNTED EXHAUST FAN. PROVIDE PRE-FABRICATED ROOF CURB AS PER SCHEDULE.
15. PROVIDE GAS UNIT HEATER. SUSPEND FROM STRUCTURE ABOVE AT 14'-0" AFF AS REQUIRED BY THE MANUFACTURER. COORDINATE LOCATION OF HEATER WITH OVERHEAD. FURNISH AND INSTALL COMBUSTION VENT / FLUE PIPING AS REQUIRED. ROUTE VENT AND FLUE PIPING ACCORDING TO MANUFACTURER'S INSTRUCTIONS. PROVIDE WALL MOUNTED THERMOSTAT WITH UNIT HEATER.
16. CONNECT 4"Φ SINGLE WALL FLUE TO UNIT HEATER PER THE MANUFACTURERS INSTRUCTIONS.
17. ROUTE 4"Φ TYPE 'B' DOUBLE WALL FLUE PIPE UP AND TERMINATE THROUGH ROOF WITH TYPE 'B' TERMINATION. MAINTAIN MIN. 10'-0" CLEARANCE FROM ALL OUTDOOR INTAKES PER THE MANUFACTURERS INSTRUCTIONS.
18. ROUTE OPEN 14"Φ EXHAUST DUCT DOWN TO 18" BELOW STRUCTURE. PROVIDE INSECT SCREEN.
19. TRANSITION EXHAUST DUCTWORK AS REQUIRED FOR CONNECTION TO EXHAUST FAN.

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.6360
fax: 913.451.6361
www.davidsonae.com

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STATE OF MISSOURI
BRIAN A. QUISSELL
NUMBER PE-2004000829
REGISTERED PROFESSIONAL ENGINEER

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OUTDOOR AIR CALCULATIONS

UNIT	Area (sqft)	OCCUPANCY CLASSIFICATION	Occupant Density #/1000 sqft	People outdoor airflow rate in breathing zone, (Rp) cfm/person	Area outdoor airflow rate in breathing zone, (Ra) cfm/sqft	Exhaust airflow rate cfm/sqft	Breathing zone outdoor airflow (Voz)	Zone air distribution effectiveness (Ez)	Zone outdoor airflow (cfm)
RTU-1-4	9685	Sales	15	7.5	0.12		2252	0.8	2815
	3000	Main Entry	10	5	0.06		330	0.8	413
								Total	3227
RTU-5	130	Office 102	5	5	0.06		11	0.8	14
	95	Mgr. Office 103	5	5	0.06		8	0.8	10
								Total	24
RTU-6	145	Break Room 106	25	5	0.06		27	0.8	34
	85	Hall 107	0	0	0.06		5	0.8	6
								Total	40

NOTES: 1. PROVIDE 825 CFM OF OUTDOOR AIR FOR EACH FOR RTU-1& 2, 790 CFM OF OUTDOOR AIR FOR RTU-3 & 4 AND 100 CFM EACH FOR RTU-5 & 6.

DIFFUSER SCHEDULE

MARK	MFGR	MODEL	NECK SIZE	FACE SIZE	FINISH	NOTES
SD-1	TITUS	121RS	22"x10"	-	WHITE	W/ OB DAMPER
SD-2	↓	TMS/3	6"Φ	12"x12"	↓	W/ TRM KIT, OB DAMPER
SD-3	↓	↓	8"Φ	24"x24"	↓	-
SD-4	↓	↓	12"Φ	↓	↓	-
SD-5	↓	S300FL	10"x6"	-	WHITE ANODIZED	W/ OB DAMPER
RG-1	↓	350F/3	20"x20"	24"x24"	WHITE	1" FILTER RETURN GRILLE
RG-2	↓	PAR/3	10"Φ	↓	↓	-
RG-3	↓	350RL	12"x12"	-	↓	-
RG-4	↓	↓	42"x42"	-	↓	-

MECHANICAL SYMBOLS

- NEW SUPPLY DIFFUSER
- NEW RETURN AIR GRILLE
- EXHAUST GRILLE/FAN
- THERMOSTAT, MOUNTED AT 48" AFF
- SMOKE DETECTOR — DUCT-MOUNTED SMOKE DETECTOR
- M — MOTORIZED DAMPER/LOUVER
- NEW DUCTWORK
- 32"x14" — SIZE OF RECTANGULAR DUCT
- 6"Φ — SIZE OF ROUND DUCT
- FLEXIBLE DUCTWORK
- FLEXIBLE CONNECTION TO FAN
- 3 — FLOOR PLAN NOTE DESIGNATION
- S.A. — SUPPLY AIR
- R.A. — RETURN AIR
- EXH. — EXHAUST AIR
- TRANSITION IN DUCT SIZE
- ELBOW WITH TURNING VANES
- MANUAL VOLUME DAMPER
- MANUAL VOLUME DAMPER
- M — MOTORIZED CONTROL DAMPER
- FD — FIRE DAMPER
- SPLITTER DAMPER WITH HORIZONTAL REGULATOR
- SUPPLY AIR DUCT UP/DOWN
- RETURN AIR DUCT UP/DOWN
- EXHAUST AIR DUCT UP/DOWN
- UP — CHANGE IN ELEVATION UP (UP) DOWN (DN) IN DIRECTION OF FLOW
- RTU-1 — SCHEDULED MECHANICAL EQUIPMENT

ROOFTOP UNIT SCHEDULE

MARK	MFGR	MODEL NO.	NOM. TONS	EVAP. CFM	EXT. STATIC P. IN. WG. (NOTE 2)	COOLING: TOTAL BTUH	COOLING: SENS. BTUH	COOLING: AMB.	COOLING: EVAP. EAT DB/WB	HEATING (GAS): BTUH INPUT	HEATING (GAS): BTUH OUTPUT	ELECTRICAL: VOLT/Φ/HZ	ELECTRICAL: BLOWER MOTOR	ELECTRICAL: MIN. MCA (AMPS)	ELECTRICAL: MIN. MOCP (AMPS)	MAXIMUM OUTDOOR AIR (CFM)	TOTAL WEIGHT (LBS)	SEER /EER	FREON	NOTES
RTU-1	TRANE	YSJ120A3S	10	4,000	0.5	115,670	92,090	105	80/67	200,000	162,000	208/3/60	3 HP	54	70	825	1,205	14.6 /11.0	R-410a	1,3,4,5,6,7,8
RTU-2	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
RTU-3	↓	YSJ102A3S	8.5	3,400	↓	98,440	79,990	↓	↓	150,000	121,500	↓	↓	48	60	790	1,165	↓	↓	↓
RTU-4	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
RTU-5	↓	4YCC4024A	2	800	↓	22,700	17,025	↓	↓	60,000	48,600	208/1/60	0.33 HP	16.7	25	100	432	14 /12	↓	2,3,4,5,6,8
RTU-6	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓

NOTES:
1. PROVIDE OUTDOOR AIR ECONOMIZER WITH STANDARD ECONOMIZER CONTROLLER, FIXED DRY BULB CONTROL, BAROMETRIC RELIEF DAMPER, CONSTANT AIR VOLUME, HINGED ACCESS DOORS, SCROLL COMPRESSORS WITH CRANKCASE HEATER, HIGH PRESSURE SWITCHES, FREEZESTAT, HAIL GUARDS. STANDARD COOLING DOWN TO 30°F. OUTDOOR AIR DAMPER TO FULLY CLOSE W/ FAN SHUTDOWN FOR ALL UNITS.
2. PROVIDE MOTORIZED OUTDOOR AIR DAMPER, CONSTANT AIR VOLUME, HINGED ACCESS DOORS, SCROLL COMPRESSORS WITH CRANKCASE HEATER, HIGH PRESSURE SWITCHES, FREEZESTAT, HAIL GUARDS. STANDARD COOLING DOWN TO 30°F. OUTDOOR AIR DAMPER TO FULLY CLOSE W/ FAN SHUTDOWN FOR ALL UNITS.
3. PROVIDE COMMERCIAL 7-DAY PROGRAMMABLE HEAT/COOL/AUTO CHANGEOVER THERMOSTAT WITH LOCKOUT FEATURE AND ECONOMIZER OUTPUT FOR EACH UNIT. ECONOMIZER/OUTDOOR AIR DAMPER IS TO CLOSE DURING UNOCCUPIED HOURS, PROVIDE LOCKING COVER.
4. PROVIDE 14" HIGH (AT LOWEST POINT) PRE-FABRICATED INSULATED ROOF CURB WITH SLOPE TO MATCH SLOPE OF ROOF FOR EACH UNIT.
5. PROVIDE NEW 2" MERV 8 FILTERS UPON COMPLETION OF CONSTRUCTION.
6. MECHANICAL CONTRACTOR SHALL COORDINATE ALL UNIT MOCP'S OF ACTUAL INSTALLED EQUIPMENT WITH ELECTRICAL CONTRACTOR.
7. PROVIDE FACTORY MOUNTED SMOKE DETECTOR IN RETURN DUCT OF UNIT.
8. EXTERNAL STATIC PRESSURE LISTED REPRESENTS STATIC PRESSURE REQUIRED FOR DUCTWORK AND DIFFUSERS OUTSIDE THE HVAC UNIT COMPLETELY INDEPENDENT OF ANY PRESSURE DROP THROUGH THE HVAC EQUIPMENT INCLUDING BUT NOT LIMITED TO FILTERS, COILS AND ECONOMIZERS. THE FAN AND MOTOR SHALL BE SIZED APPROPRIATELY TO MEET THIS DEFINITION OF EXTERNAL STATIC PRESSURE.

EXHAUST FAN SCHEDULE

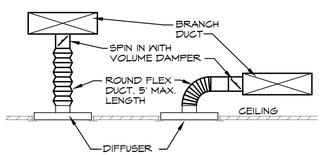
MARK	MFGR	MODEL	CFM	EXTERNAL STATIC P. IN. WG.	RPM	ELECTRICAL: VOLT/Φ/HZ	ELECTRICAL: PWR.	FAN TYPE	CONTROLS	NOTES
EF-1	COOK	GC-166	150	0.25	1,100	120/1/60	51 W	CEILING EXH.	LIGHTS	1
EF-2	↓	GC-148	125	↓	1,075	↓	48 W	↓	↓	1
EF-3	↓	135ACEB	1,500	↓	1,118	↓	1/4 HP	ROOF EXH.	SWITCH	2,3

NOTES:
1. PROVIDE CEILING GRILLE, INTEGRAL BACK DRAFT DAMPER, VARI-SPEED CONTROLLER (NEAR FAN AND ABOVE CEILING), AND WEATHER HEAD.
2. PROVIDE INSULATED 13-1/2" HIGH PREFABRICATED ROOF CURB, BACKDRAFT DAMPER AND BIRD SCREEN.
3. EXHAUST FAN SHALL BE HIGH VOLUME FAN AND SHALL BE PROVIDED WITH 3 SPEED SWITCH.

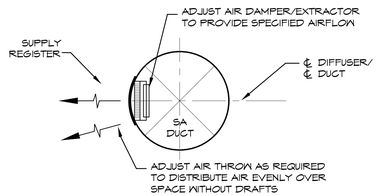
GAS FIRED UNIT HEATER SCHEDULE

MARK	MFGR	MODEL	CFM	HEATING (GAS): BTUH INPUT	HEATING (GAS): BTUH OUTPUT	ELECTRICAL: VOLT/Φ/HZ	ELECTRICAL: HP	NOTES
UH-1	REZNOR	UDAP-75	961	75,000	62,250	120/1Φ/60	.06	1,2,3

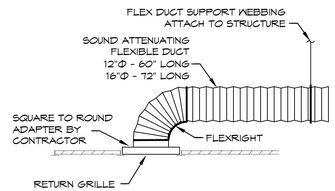
NOTES:
1. PROVIDE UNIT ELECTRONIC PILOT IGNITION & ALUMINIZED STEEL HEAT EXCHANGER.
2. PROVIDE UNIT WITH WALLMOUNTED THERMOSTAT.



1. DIFFUSER DETAIL
SCALE: NONE



2. SPRIL DUCT MOUNTED REGISTER
SCALE: NONE



3. RETURN SOUND BOOT DETAIL
SCALE: NONE

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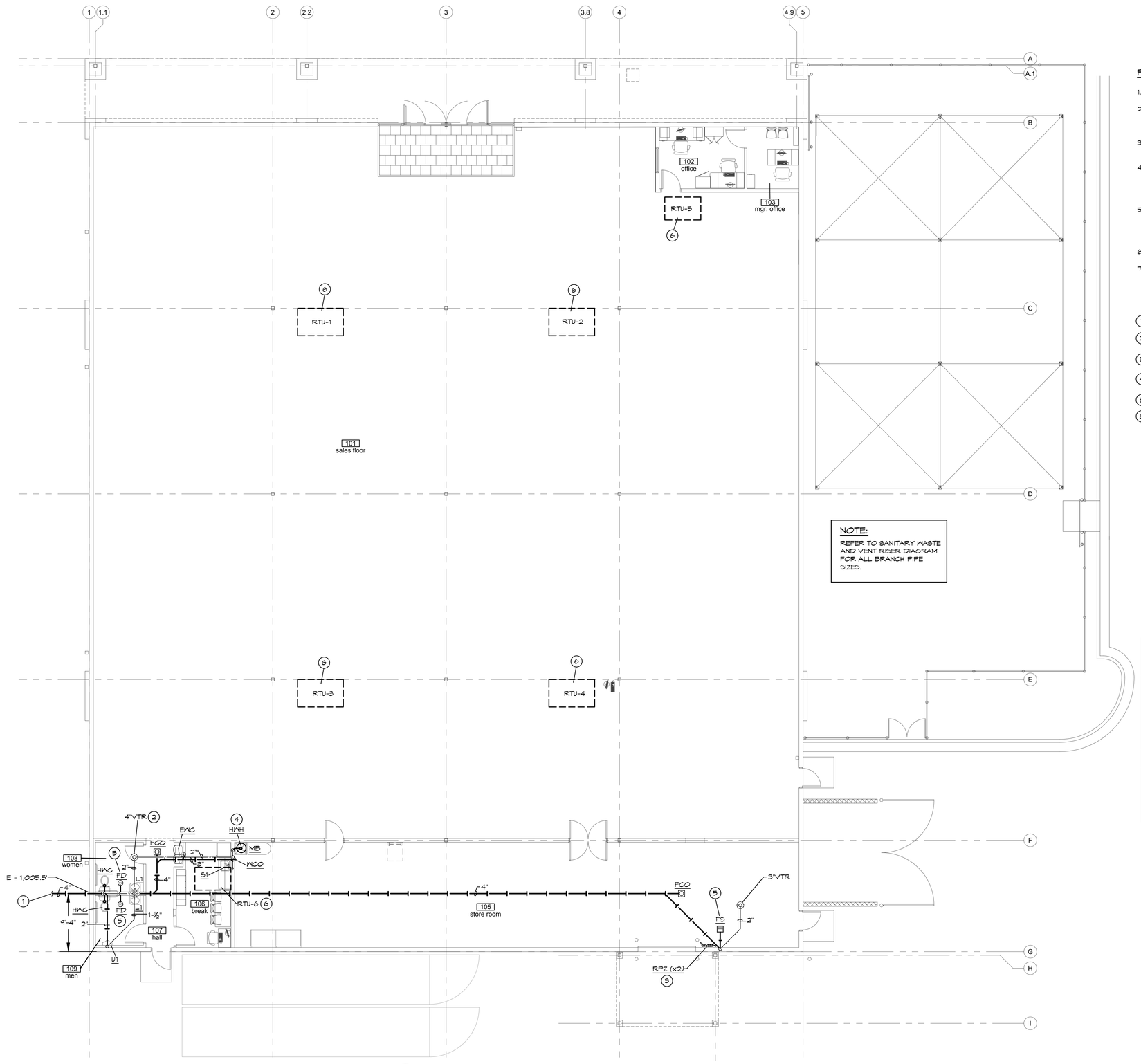
davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.6360
fax: 913.451.6361
www.davidsonae.com

2/23/2023

STATE OF MISSOURI
BRIAN A. QUISSELL
NUMBER PE-2004000829
REGISTERED PROFESSIONAL ENGINEER



WASTE & VENT FLOOR PLAN

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

FFE = 1,009'

PLUMBING GENERAL NOTES:

1. INSTALL ALL PIPE, ETC. AS HIGH AS POSSIBLE.
2. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACES AVAILABLE, AND WITHOUT INTERFERENCES.
3. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS AND MOUNTING HEIGHTS OF FIXTURES.
4. REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR REQUIREMENTS FOR SUPPORTING PIPING, EQUIPMENT, ETC. FROM THE STRUCTURE. PROVIDE ADDITIONAL STEEL AS REQUIRED TO PROPERLY SUPPORT SYSTEMS FROM THE STRUCTURE.
5. PROVIDE 1" SCHEDULE 40 PVC CONDENSATE DRAIN PIPE FOR EACH ROOFTOP UNIT LAID DIRECTLY ON ROOF TO NEAREST ROOF DRAIN. PROVIDE WATER TRAP AND CLEAN OUTS AS DETAILED. SECURE PVC PIPE TO DRAIN WITH NYLON STRAP.
6. NO PIPING SHALL BE ROUTED OVER THE TOP OF ELECTRICAL PANELS.
7. CONTRACTOR TO TEST WATER PRESSURE ON SITE AND PROVIDE PRESSURE REDUCING VALVE ON WATER SERVICE IF PRESSURE IS OVER 80 PSI.

PLUMBING PLAN NOTES:

1. SEE CIVIL PLAN FOR CONTINUATION OF SANITARY SEWER. MAINTAIN MIN 30" COVER.
2. LOCATION OF 4" VTR. VERIFY 10' CLEARANCE FROM ALL OUTDOOR AIR INTAKES. SEAL PENETRATION WEATHER-TIGHT.
3. ROUTE DRAIN FROM RPZ BFP TO FLOOR SINK WITH AN AIR GAP.
4. PROVIDE WATER HEATER T & P RELIEF DRAIN PIPE (¾" Ø) AND DISCHARGE TO MOP BASIN WITH AIR GAP.
5. PROVIDE TRAP SEAL ON FLOOR DRAINS SUSCEPTIBLE TO DRYING OUT.
6. CONNECT CONDENSATE DRAIN TO RTUS AS REQUIRED AND AS DETAILED.

PLUMBING FIXTURE BRANCH PIPING SCHEDULE

FIXTURE	WASTE	VENT	CW	HW
WATER CLOSET (TANK TYPE)	4"	2"	1/2"	" "
URINAL	2"	1-1/2"	3/4"	" "
LAVATORY	1-1/4"	1-1/4"	1/2"	1/2"
SINK	1-1/2"	1-1/2"	1/2"	1/2"
FLOOR DRAIN	2"	2"	" "	" "
MOP BASIN	2"	2"	3/4"	3/4"
ELECTRIC WATER COOLER (BI-LEVEL)	1-1/2"	1-1/2"	1/2"	" "

NOTE: INDIVIDUAL VENTS FOR FIXTURES ON PLANS AND RISER DIAGRAMS HAVE BEEN INCREASED WHERE HORIZONTAL VENT LENGTH IS IN EXCESS OF THE MAXIMUM DISTANCE INDICATED BY THE CODE.

PLUMBING DRAINAGE CALCULATIONS

SN	FIXTURE	QTY.	FIXTURE UNIT	TOTAL FIXTURE UNIT
1	WATER CLOSET (TANK TYPE)	2	4	8
2	URINAL	1	4	4
3	LAVATORY	2	1	2
4	SINK	1	2	2
5	MOP BASIN	1	2	2
6	FLOOR DRAIN	2	2	4
7	FLOOR SINK	1	2	2
8	ELECTRIC WATER COOLER	1	1	1
	TOTAL			25 FU

WASTE MAINS - 4"
VENT VAINS - 3"

BC PROJECT #: 22784
MISSOURI PE COA #2009003629

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5720 Reeder Shawnee, Ks. 66203 (913)262-1772

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date
02.24.2023
drawn by
SK/BH
checked by
BQ/DS
revisions

sheet number
P1.0
drawing type
PERMIT
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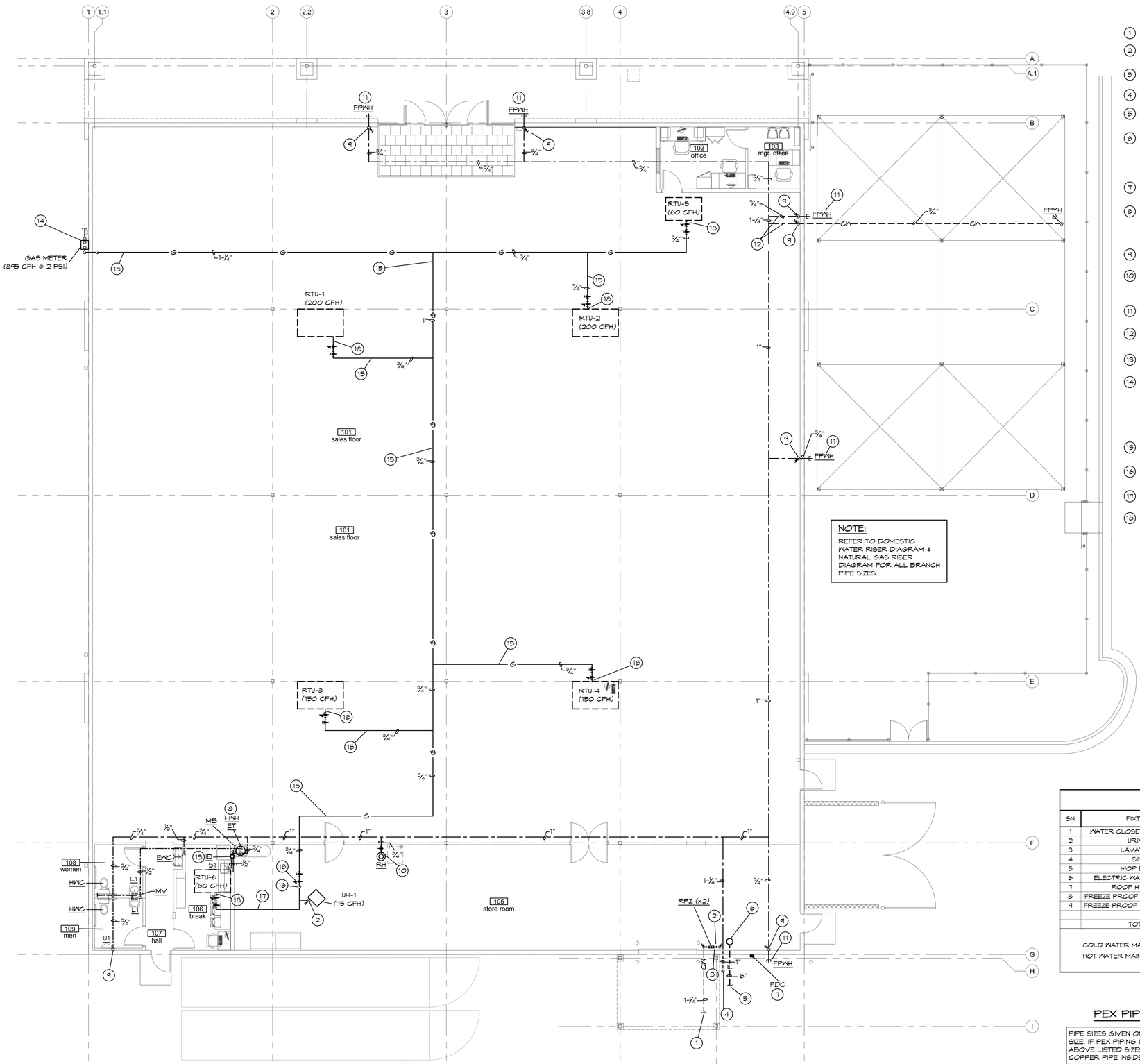

WATER & GAS FLOOR PLAN

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

NOTE:
REFER TO DOMESTIC WATER RISER DIAGRAM & NATURAL GAS RISER DIAGRAM FOR ALL BRANCH PIPE SIZES.

PLUMBING PLAN NOTES:

1. SEE CIVIL PLAN FOR CONTINUATION OF DOMESTIC C.W. MAINTAIN MIN 48" COVER.
2. PROVIDE 1-¼" RPZ BACKFLOW PREVENTER FOR DOMESTIC WATER LINE INSIDE BUILDING. INSTALL 24" A.F.F. & 6" FROM WALL. SEE DOMESTIC WATER RISER FOR MORE INFORMATION.
3. PROVIDE 1" RPZ BACKFLOW PREVENTER FOR IRRIGATION SYSTEM AND INSTALL BELOW DOMESTIC RPZ. SEE DOMESTIC WATER RISER FOR MORE INFORMATION.
4. CAP 1" IRRIGATION LINE FOR CONNECTION BY IRRIGATION CONTRACTOR.
5. 6" FIRE LINE, SEE CIVIL PLANS FOR CONTINUATION. MAINTAIN A MINIMUM 48" BURY FOR FREEZE PROTECTION.
6. 6" FIRE LINE THRU FLOOR. PROVIDE DOUBLE CHECK VALVE ASSEMBLY (DCVA). ROUTE DRAIN FROM DOUBLE CHECK DETECTOR ASSEMBLY TO NEAREST FLOOR DRAIN WITH AIR GAP. SEAL EXTERIOR WALL PENETRATION WEATHER TIGHT AS REQUIRED. COORDINATE WITH SPRINKLER CONTRACTOR FOR PROPER INSTALLATION. COORDINATE WITH WATER DEPARTMENT FOR SERVICE FLUSHING REQUIREMENTS. CAP LINE FOR FUTURE CONTINUATION BY SPRINKLER CONTRACTOR.
7. COORDINATE LOCATION OF FIRE DEPARTMENT CONNECTION WITH FIRE MARSHAL.
8. PROVIDE ELECTRIC WATER HEATER MOUNTED ON SHELF ABOVE MOP BASIN AS HIGH AS POSSIBLE. MAKE HOT AND COLD WATER PIPING CONNECTIONS THROUGH DIELECTRIC UNIONS. PROVIDE AND INSTALL ALL HARDWARE AND APPURTENANCES FOR COMPLETE INSTALLATION PER APPLICABLE CODES AND MANUFACTURER'S RECOMMENDATIONS. PROVIDE THERMAL EXPANSION TANK.
9. ROUTE PIPING ON INTERIOR SIDE OF BLOCK WALL FOR FREEZE PROTECTION.
10. INSTALL ROOF HYDRANT PER THE MANUFACTURER'S REQUIREMENTS. COORDINATE WITH ROOFING CONTRACTOR FOR PENETRATION. ROUTE DRAIN PIPING FROM VALVE DRAIN TO MOP BASIN WITH AN AIR GAP.
11. INSTALL FREEZE PROOF WALL HYDRANT 18" ABOVE GRADE / FINISHED FLOOR.
12. ENSURE PIPE ROUTING DOES NOT CONFLICT WITH SHELVING. PAINT INSULATED PIPING TO MATCH WALL COLOR.
13. PROVIDE ICE MAKER BOX WITH VALVE FOR CONNECTION TO REFRIGERATOR BY OTHERS.
14. COORDINATE WITH GAS COMPANY FOR INSTALLATION OF A METER WITH CAPACITY FOR 895 CFH @ 2 PSI. ROUTE PIPING UP INSIDE THE EXTERIOR WALL AND PENETRATE THE PARAPET WALL ONTO ROOF. ALL CONCEALED JOINTS ARE TO BE WELDED OR USE FITTINGS APPROVED FOR CONCEALED USE. VERIFY ALL EQUIPMENT GAS CAPACITIES AND OPERATING PRESSURES PRIOR TO INSTALLATION OF ANY PIPING. GAS PIPE SIZING IS BASED ON 247 FT ESTIMATED LONGEST LENGTH. OBTAIN APPROVAL FROM GAS COMPANY FOR ELEVATED PRESSURE BEFORE INSTALLING ANY GAS PIPING.
15. GAS PIPING ON ROOF. SUPPORT AS REQUIRED AND AS DETAILED.
16. ROUTE GAS PIPE DOWN THROUGH ROOF. COORDINATE WITH GC TO SEAL PENETRATION WEATHER TIGHT AND MAINTAIN ROOF WARRANTY.
17. GAS PIPING BELOW ROOF. SUPPORT AS REQUIRED.
18. ¾" GAS (2PSI.) WITH SHUT-OFF VALVE AND PRESSURE REGULATOR ON ROOF (¾" SENSUS #143-80-2, SIZED FOR CFH LISTED, 2PSI. INLET PRESSURE WITH 7" W.C. OUTLET PRESSURE). ¾" GAS PIPE FROM REGULATOR TO EQUIPMENT. CONNECT GAS PIPING TO EQUIPMENT AS REQUIRED AND AS DETAILED.

GAS DEMAND SCHEDULE

EQUIPMENT		GAS INPUT (BTUH)	
TAG	ITEM	NEW	EXISTING
RTU-1	ROOF TOP UNIT -1	200,000	
RTU-2	ROOF TOP UNIT -2	200,000	
RTU-3	ROOF TOP UNIT -3	150,000	
RTU-4	ROOF TOP UNIT -4	150,000	
RTU-5	ROOF TOP UNIT -5	60,000	
RTU-6	ROOF TOP UNIT -6	60,000	
UH-1	UNIT HEATER - 1	75,000	
TOTAL BTU/HR		895,000	0
NEW TOTAL BTU/HR (EXISTING AND NEW)		895,000	
NEW TOTAL CFH (EXISTING AND NEW)		895	
MAXIMUM DEVELOPMENT LENGTH >		200 FT	
MINIMUM SIZE OF GAS LINE REQUIRED		1-1/4" DIA.	

NOTE
GAS LINE SIZED AS PER TABLE 402.4(5) OF IFC FOR PRESSURE OF 2 PSI.

PLUMBING FIXTURE WATER COUNT

SN	FIXTURE	QTY.	CW FU	CW TOTAL FU	HW FU	HW TOTAL FU	COMBINED FU	TOTAL COMBINED FU
1	WATER CLOSET (TANK TYPE)	2	5	10	0	0	5	10
2	URINAL	1	5	5	0	0	5	5
3	LAVATORY	2	1.5	3.0	1.5	3.0	2	4
4	SINK	1	2.25	2.25	2.25	2.25	3	3
5	MOP BASIN	1	2.25	2.25	2.25	2.25	3	3
6	ELECTRIC WATER COOLER	1	0.25	0.25	0	0	0.25	0.25
7	ROOF HYDRANT	1	3	3	0	0	3	3
8	FREEZE PROOF WALL HYDRANT	5	3	15	0	0	3	15
9	FREEZE PROOF YARD HYDRANT	1	3	3	0	0	3	3
	TOTAL			43.75		7.50		46 FU

COLD WATER MAIN = 1-1/4"
HOT WATER MAIN - 3/4"

PEX PIPING REQUIREMENTS

PIPE SIZES GIVEN ON THE DRAWINGS ARE NOMINAL COPPER PIPE SIZE. IF PEX PIPING IS USED, INCREASE PEX PIPING ONE SIZE ABOVE LISTED SIZES AS REQUIRED TO EQUAL OR EXCEED COPPER PIPE INSIDE DIAMETER.

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.9990
fax: 913.451.9991
www.davidsonae.com

2/23/2023

STATE OF MISSOURI
BRIAN A. QUISSELL
NUMBER
PE-2004000839
REGISTERED PROFESSIONAL ENGINEER

a new store for Westlake ACE Hardware

3511 SW Market Street
Lee's Summit, Missouri 64082

date
02.24.2023
drawn by
SK/BH
checked by
BQ/DS
revisions

BC PROJECT #: 22784
MISSOURI PE COA #2009003629

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davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.6360
fax: 913.451.6361
www.davidsonae.com

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STATE OF MISSOURI
BRIAN A. QUISSELL
NUMBER PE-2004000829
REGISTERED PROFESSIONAL ENGINEER

PLUMBING FIXTURE SCHEDULE:

WC HANDICAP WATER CLOSET: TOTO, #CST744SL, "DRAKE CLOSE COUPLED TOILET", 1.6 GALLON FLUSH, 16-1/2" HIGH ELONGATED BOWL, FLOOR MOUNTED, FLOOR OUTLET, TANK TYPE, VITREOUS CHINA, SIPHON-JET ACTION, #SC534 OPEN FRONT SEAT WITH CHECK HINGE AND LESS COVER, CHROME PLATED ANGLE STOP AND RISER. HANDLE ON WIDE SIDE OF FIXTURE.

U1 URINAL, WALL HUNG: TOTO, #UT447.01, VITREOUS CHINA, WASH OUT, WALL HUNG URINAL WITH 3/4" TOP SPUD, #TMU1NNC-12 FLUSH VALVE, FLOOR MOUNTED FIXTURE SUPPORT. SET RIM HEIGHT PER ARCHITECTURAL DRAWINGS.

L1 HANDICAP LAVATORY, WALL HUNG: TOTO #LT307, 20"X 18", VITREOUS CHINA,FRONT OVERFLOW, DELTA #501 FAUCET WITH SINGLE METAL LEVER FAUCET,OFFSET GRID ELBOW DRAIN AND 1-1/4" TAILPIECE, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT (MOUNTED PARALLEL WITH WALL), CHROME PLATED LOOSE KEY ANGLE STOPS AND RISERS, FLOOR MOUNTED CONCEALED ARM LAVATORY SUPPORT, INSULATE EXPOSED DRAIN, WATER SUPPLIES, AND VALVES WITH PROWRAP SEAMLESS MOLDED CLOSED CELL VINYL INSULATION.

S1 SINK-ELKAY, #LRAD-2222, 19"X16"X 6-1/2" DEEP BOWL,21-3/8"X 21-3/8" CUT-OUT, ADA COMPLIANT, SINGLE COMPARTMENT, SELF-RIMMING STAINLESS STEEL SINK WITH SATIN FINISH AND SOUND DAMPENING UNDERCOATING, #LK-1000CR FAUCET, SWING SPOUT, AERATOR, SINGLE LEVER HANDLE, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT, CHROME PLATED ANGLE STOPS AND RISERS, IN-SINK-ERATOR #BADGER 5 DISPOSAL, 1/2 HP, 120 VOLT.

MB MOP BASIN: FIAT, #MSB-2424, MOLDED STONE MOP BASIN, 2" DRAIN, 24"X 24" BASIN, VINYL BUMPER GUARD, STERN WILLIAMS #T-10-VB FAUCET, SPRING CHECKS, VACUUM BREAKER, INTEGRAL STOPS, WALL BRACE & PAIL HOOK, WALL BRACKET WITH 30" HOSE.

EWC ELECTRIC WATER COOLER: ELKAY, #LZSTL8WSLP BARRIER FREE, BI-LEVEL ADA WATER COOLER WITH EZH20 BOTTLE FILLING STATION, 8.0 GPH, 50 DEGREES F WATER WITH 90 DEGREES F AIR TEMPERATURE, 120 VOLT, COLOR TO BE SELECTED BY ARCHITECT AFTER AWARD OF CONTRACT, FRONT AND SIDE PUSH BARS, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT, CHROME PLATED LOOSE KEY ANGLE STOP, FLOOR MOUNTED CARRIER AND CANE APRON.

FD FLOOR DRAIN: JR SMITH, #2005-A, CAST IRON FLOOR DRAIN WITH ADJUSTABLE TOP, 6" NIKALOY STRAINER. PROVIDE WITH #2692 QUAD CLOSE TRAP SEAL DEVICE.

FS FLOOR SINK: JR SMITH., #305 SQUARE PVC FLOOR SINK WITH STAINLESS STEEL MESH DEBRIS SCREEN, PVC STRAINER. PROVIDE WITH #2692 QUAD CLOSE TRAP SEAL DEVICE.

HWH HOT WATER HEATER: AO SMITH #DEL-10, 10 GALLON STORAGE, 120 VOLT, 1500 WATT ELEMENT, ASME TEMPERATURE AND PRESSURE RELIEF VALVE. PROVIDE HOLD-RITE #40-SWHP-W WALL-HUNG WATER HEATER PLATFORM.

ET HOT WATER EXPANSION TANK: AMTROL, #ST-5, 2 GALLON EXPANSION TANK WITH DIAPHRAGM.

MV MIXING VALVE: WATTS, #LFMMV THERMOSTATIC CONTROLLED MIXING VALVE,LEAD FREE BRONZE BODY, LOCKED TEMPERATURE ADJUSTMENT CAP (VANDAL RESISTANT), SOLID WAX HYDRAULIC PRINCIPLE THERMOSTAT,INTEGRAL FILTER WASHERS AND CHECK VALVES ON HOT AND COLD INLETS.(SET TO 110°F) ASSE #1017,#1069,#1070

RPZ REDUCED ZONE PRESSURE BACKFLOW PREVENTOR: WATTS #LF009, LEAD FREE BRONZE BODY CONSTRUCTION, TWO, IN-LINE INDEPENDENT CHECK VALVES, REPLACEABLE CHECK SEATS WITH AN INTERMEDIATE RELIEF VALVE, AND BALL VALVE TEST COCKS.

IB ICE BOX: SIOUX CHIEF #696-1000, ICE BOX WITH 1/2" INLET AND CONNECTION AND 1/4-TURN SHUT OFF VALVE.

FPWH FREEZEPROOF WALL HYDRANT: JR SMITH #5609, 3/4" SIZE, NICKEL-BRONZE FACE, KEY OPERATED, INTEGRAL VACUUM BREAKER.

FPYH FREEZEPROOF YARD HYDRANT: JR SMITH #5904, 3/4" HOSE CONNECTION, LOCKABLE HEAVY DUTY CAST IRON HEAD WITH PAIL HOOK, FLOW LOCK WHEEL.

RH ROOF HYDRANT: WOODFORD FREEZELESS ROOF HYDRANT # RHY2-MS WITH ROOF MOUNTING SYSTEM, DUAL CHECK BACKFLOW PREVENTER WITH ¾" HOSE CONNECTION, ASSE 1052 LISTED.

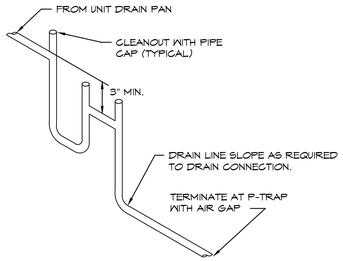
FCO/WCO VINYL TILE FLOOR: JR SMITH #4140, OR EQUAL.
QUARRY TILE FLOOR: JR SMITH #4200, OR EQUAL.
CARPETED FLOOR: JR SMITH #4020-Y, OR EQUAL.
UNFINISHED FLOOR: JR SMITH #4020, OR EQUAL.
WALL: JR SMITH #4472, OR EQUAL, 24" ABOVE THE FLOOR.

PIPE HANGER SCHEDULE

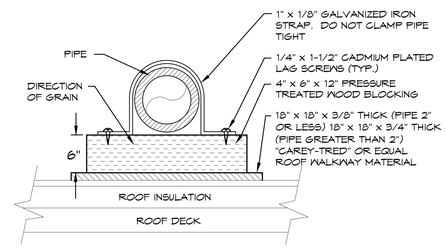
PIPE MATERIAL	MAXIMUM HANGER SPACING	HANGER ROD DIAMETER
ABS (All sizes)	4'	3/8"
PVC (All Sizes)	4'	3/8"
CPVC, 1 inch and smaller	3'	1/2"
CPVC, 1-1/4 inches and larger	4'	1/2"
Cast Iron (All Sizes)	5'	5/8"
Cast Iron (All Sizes) with 10 foot length of pipe	10'	5/8"
Copper Tube, 1-1/4 inches and smaller	6'	1/2"
Copper Tube, 1-1/2 inches and larger	10'	1/2"
Steel, 3 inches and smaller	12'	1/2"
Steel, 4 inches and larger	12'	5/8"
Pex, 1" and below without support channel	32"	3/8"
Pex, 1-1/4" and above without support channel	48"	3/8"
Pex ¾" and below with support channel	6'	3/8"
Pex 1" and above with support channel	8'	3/8"

PLUMBING SYMBOLS

- SOIL AND WASTE PIPING BELOW FLOOR/GRADE
- SOIL AND WASTE PIPING ABOVE FLOOR/GRADE
- SANITARY VENT PIPING ABOVE GRADE
- SANITARY VENT PIPING BELOW GRADE
- DOMESTIC COLD WATER PIPING
- DOMESTIC HOT WATER PIPING
- GAS PIPING
- EQUIPMENT DRAIN LINE
- FIRE LINE
- PIPING TURNING DOWN
- PIPING TURNING UP
- TEE TOP CONNECTION
- UNION
- BACKFLOW PREVENTER
- FD — FLOOR DRAIN
- FCO — FLOOR CLEAN OUT
- WCO — WALL CLEAN OUT
- VALVE
- BALANCING VALVE
- PRESSURE REGULATOR
- CHECK VALVE
- CONNECT TO EXISTING
- I.E. — INVERT ELEVATION OF PIPE
- A — MATCH MARKS ON PLUMBING RISER DIAGRAM
- TEMPERATURE AND PRESSURE RELIEF VALVE
- M — IRRIGATION / WATER METER



CONDENSATE DRAIN DETAIL
SCALE: NONE



ROOF PIPE SUPPORT DETAIL
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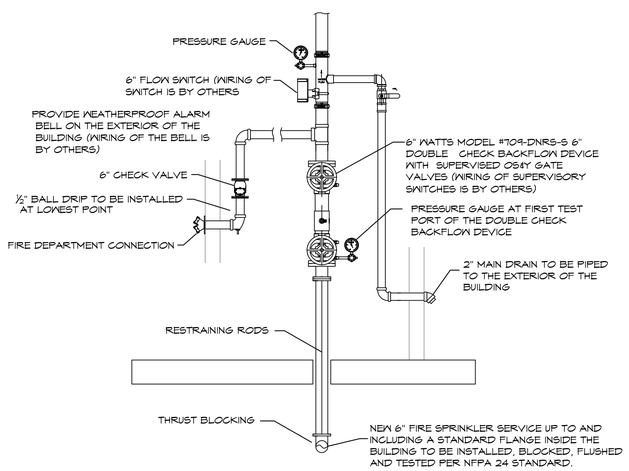
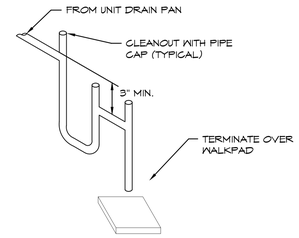


FIRE PROTECTION RISER ASSEMBLY
SCALE: NONE



CONDENSATE DRAIN DETAIL
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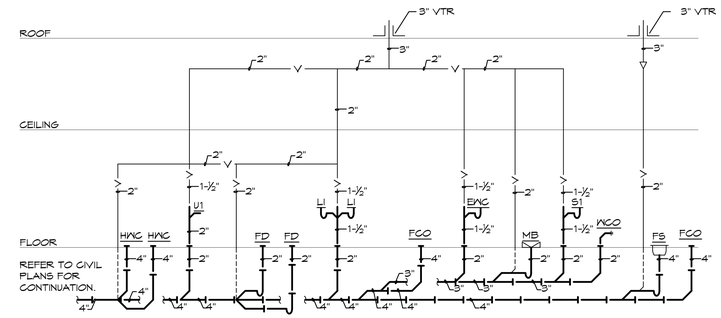
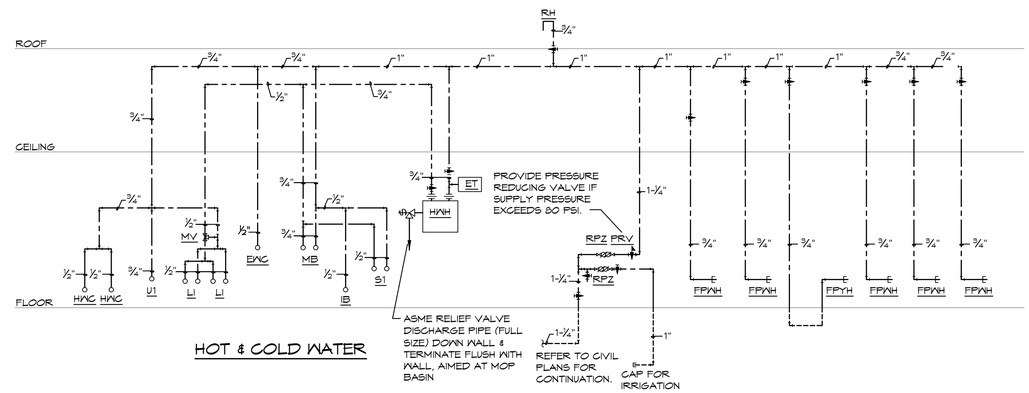
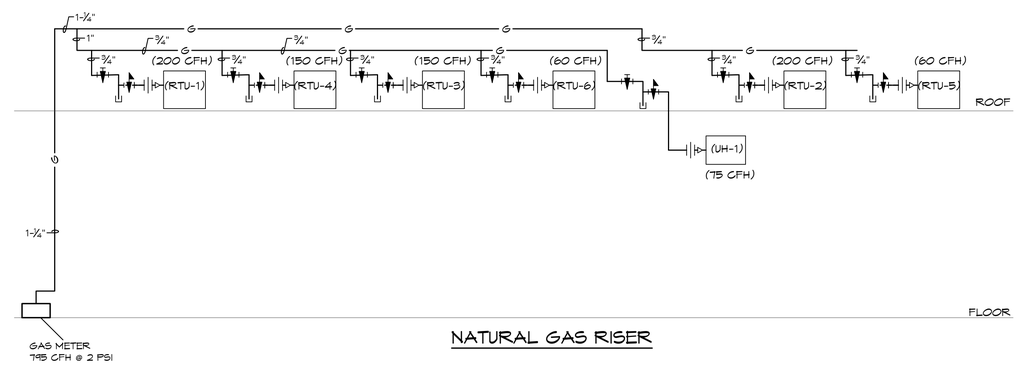


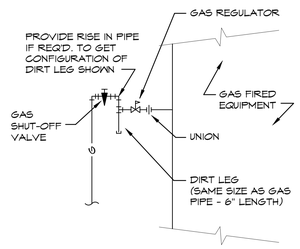
WASTE & VENT



HOT & COLD WATER

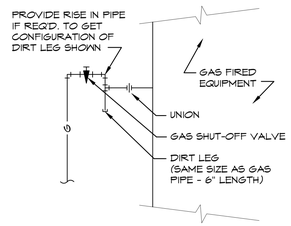


NATURAL GAS RISER



GAS PRESSURE REGULATORS FOR ROOFTOP UNITS (RTU), FURNACES AND UNIT HEATERS SHALL BE SENSUS #143-00-2, 2 PSI INLET / 7" WC OUTLET PRESSURE WITH THE ORIFICE & SPRING SIZE AS RECOMMENDED BY THE MANUFACTURER.

GAS CONNECTION DETAIL
SCALE: NONE



GAS CONNECTION DETAIL
SCALE: NONE

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3511 SW Market Street
Lee's Summit, Missouri 64082

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As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
2/28/2023

ELECTRICAL SPECIFICATIONS

1. GENERAL PROVISIONS:
   - A. PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, NECESSARY FOR THE COMPLETE INSTALLATION OF THE ELECTRICAL SYSTEMS OUTLINED.
   - B. OBTAIN ALL PERMITS, FEES, LICENSES, INSPECTIONS, AND CERTIFICATES OF COMPLIANCE OR APPROVAL AS REQUIRED BY THE AUTHORITIES.
   - C. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST APPROVED EDITION OF THE NATIONAL ELECTRIC CODE (NEC), AND ALL APPLICABLE LAWS, CODES AND REGULATIONS OF THE GOVERNMENTAL BODIES HAVING JURISDICTION OVER THE SITE.
   - D. ALL TESTING REQUIRED BY AUTHORITIES SHALL BE CONSIDERED PART OF THIS WORK.
   - E. DURING CONSTRUCTION, ALL FIXTURES, EQUIPMENT, CONDUIT, ETC. SHALL BE COVERED, PLUGGED, OR CAPPED AS REQUIRED TO KEEP CLEAN AND UNDAMAGED. ALL DAMAGED ITEMS SHALL BE RESTORED TO ORIGINAL CONDITION OR REPLACED. ALL PROTECTIVE COVERING SHALL BE REMOVED BEFORE FINAL ACCEPTANCE.
   - F. PROVIDE ALL NECESSARY CUTTING AND PATCHING OF WALLS, FLOORS, CEILINGS, AND ROOFS AS NECESSARY. PATCH AROUND ALL OPENINGS SHALL MATCH ADJACENT AREA. COORDINATE ALL ROOFING WORK WITH OWNER OR RESPONSIBLE PARTY, SO THAT THE EXISTING ROOFING WARRANTY WILL BE MAINTAINED.
   - G. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS AGAINST DEFECTS FOR A PERIOD OF ONE YEAR FROM FINAL ACCEPTANCE.
   - H. CONTRACTOR SHALL PROVIDE ACCESS PANELS WHERE NECESSARY FOR CONCEALED ELECTRICAL COMPONENTS.
2. OPERATION AND MAINTENANCE MANUALS:
   - A. DURING THE COURSE OF CONSTRUCTION, COLLECT AND COMPILE OPERATING INSTRUCTIONS, WIRING DIAGRAMS, CATALOG CUTS, LUBRICATION AND PREVENTIVE MAINTENANCE INSTRUCTIONS, PARTS LISTS, ETC. FOR ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT.
   - B. ALL LITERATURE AND INSTRUCTIONS SHIPPED WITH THE EQUIPMENT SHALL BE SAVED FOR INCLUSION IN THE OPERATION AND MAINTENANCE MANUALS.
   - C. ALL LITERATURE LISTED ABOVE AND ALL PAPERS LISTING WARRANTIES, ETC. SHALL BE COLLATED AND LABELED WITH THE PROJECT NAME, ADDRESS, ARCHITECT, ENGINEER, CONTRACTORS, ETC. CONTRACTORS, ETC. DOCUMENTS SHALL BE COMPILED AND BOUND IN DIGITAL FILE OR 3 RING BINDER.
3. MANUFACTURERS:
   - A. MANUFACTURERS, MODEL NUMBERS, ETC. INDICATED OR SCHEDULED ON THE DRAWINGS SHALL BE INTERPRETED AS HAVING ESTABLISHED A STANDARD OF QUALITY AND SHALL NOT BE CONSTRUED AS LIMITING COMPETITION. ARTICLES, FIXTURES, ETC. OF EQUAL QUALITY BY MANUFACTURERS SHALL BE ACCEPTABLE, SUBJECT TO STRUCTURAL AND ELECTRICAL CONSTRAINTS OF THE PROJECT DESIGN, UNLESS NOTED OTHERWISE.
4. TESTING, AND BALANCING:
   - A. ALL CIRCUITS SHALL BE TESTED FOR CONTINUITY, SHORTS, AND GROUNDS BEFORE CONNECTING TO THE PROPER PHASE AS DESIGNED TO BALANCE THE LOADING BETWEEN PHASES.
   - B. POWER AND LIGHTING PANELS SHALL BE PROPERLY PHASED TO DISTRIBUTE THE LOAD AND SHALL BE CONNECTED AND ADJUSTED TO OPERATE AS SPECIFIED.
   - C. ALL MOTORS AND SIMILAR EQUIPMENT SHALL BE CHECKED FOR PROPER PHASE ROTATION AND OPERATION.
5. RACEWAYS:
   - A. CONDUIT INSIDE THE BUILDING SHALL BE METALLIC TUBING (EMT), BEARING THE UL LABEL, WITH COMPRESSION TYPE FITTINGS OR SCREW SET FITTINGS.
   - B. CONDUIT EXPOSED TO THE WEATHER, INSTALLED UNDERGROUND, IN CONCRETE, OR USED FOR SERVICE ENTRANCE SHALL BE STANDARD RIGID CONDUIT (GALVANIZED) WITH THREADED FITTINGS.
   - C. UNDERGROUND CONDUIT MAY BE POLYVINYL CHLORIDE WITH A DEFLECTION TEMPERATURE UNDER LOAD AT 264 PSI, OF 70 DEGREES C, AND A TENSILE STRENGTH OF 5,200 PSI. JOINTS SHALL BE FLUSH SOLVENT WELDED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. CONDUIT SHALL BE EQUAL TO CARLON POWER AND COMMUNICATIONS DUCT TYPE DB (DIRECT BURIAL). CONDUIT AND FITTINGS SHALL BE PRODUCED BY THE SAME MANUFACTURER.
   - D. FLEXIBLE METAL CONDUIT SHALL ONLY BE USED FOR CONNECTIONS TO MOTORS, TRANSFORMERS, AND LIGHT FIXTURES. MAXIMUM LENGTH SHALL BE 6'-0".
6. CONDUCTORS:
   - A. WIRES SHALL BE CONTINUOUS WITHOUT SPLICES OR TAPS IN CONDUIT RUNS. ALL SPLICES SHALL BE MADE IN JUNCTION, PULL, OR OUTLET BOXES. ALL WIRE SHALL BE INSTALLED IN CONDUIT, WIREWAYS, OR OTHER PROTECTIVE COVER SANCTIONED BY CODES.
   - B. CONDUCTORS FOR LIGHTING AND POWER SHALL BE COPPER, MINIMUM NO. 12 A.W.G., 600 VOLT.
   - C. NO. 10 GAUGE AND SMALLER CONDUCTORS SHALL BE TYPE THWN (WET LOCATIONS) OR THHN (DRY LOCATIONS), SOLID CONDUCTOR, UNLESS OTHERWISE INDICATED.
   - D. NO. 8 GAUGE AND LARGER CONDUCTORS SHALL BE TYPE THWN (WET LOCATIONS) OR THHN (DRY LOCATIONS), STRANDED, UNLESS OTHERWISE INDICATED.
   - E. SERVICE ENTRANCE AND PANEL FEEDER CONDUCTORS, NO. 3 GAUGE AND LARGER SHALL BE TYPE XHHW-2 (WET LOCATIONS) OR THHN (DRY LOCATIONS), STRANDED COPPER, UNLESS OTHERWISE INDICATED.
   - F. ALUMINUM SERVICE WIRE MAY BE USED FOR SERVICE ENTRANCE CONDUCTORS ONLY. ALL OTHER WIRING SHALL BE COPPER CONDUCTORS AS HEREINBEFORE SPECIFIED.
   - G. ALUMINUM CONDUCTORS SHALL BE TYPE "XHHW-2", ALCAN, "STABILOY" TYPE ALLOY CONDUCTORS UTILIZING "AA-8030" ALUMINUM ALLOY. CONDUCTORS SHALL BE UL LISTED.
   - H. ALL ALUMINUM CONDUCTORS SHALL BE TERMINATED IN CONNECTORS OR LUGS WHICH ARE DUAL RATED (AL7CU OR AL9CU) AND ARE LISTED BY UL FOR USE WITH ALUMINUM OR COPPER CONDUCTORS AND SHALL BE SIZED TO ACCEPT ALUMINUM CONDUCTORS OF THE AMPACITY SPECIFIED.
7. MC CABLE:
   - A. MC CABLE SHALL CONSIST OF INTERLOCK ARMORED CABLE MADE OF THREE OR FOUR TYPE THWN SOLID (NO AWG AND LARGER MAY BE STRANDED) COPPER CONDUCTORS RATED 90°C FOR DRY LOCATIONS, WITH NYLON OR EQUIVALENT UL LISTED JACKET, PER UL STANDARD 83 THE THREE CONDUCTORS SHALL BE TWISTED TOGETHER WITH THE COPPER GROUNDING CONDUCTOR, SUITABLE FILLERS, AND WRAPPED IN BINDER TAPE. THE ASSEMBLY SHALL BE ARMORED WITH SPIRALLY WRAPPED INTERLOCKED ARMOR OF ALUMINUM OR GALVANIZED STEEL.
   - B. CABLES SHALL BE TESTED IN ACCORDANCE WITH UL STANDARD 1569 FOR TYPE MC CABLE AND RATED AT 600 VOLTS, 90 DEG. C FOR DRY LOCATIONS AND 75 DEG. C FOR WET LOCATIONS.
8. WIRING DEVICES:
   - A. WALL SWITCHES SHALL BE SPECIFICATION GRADE, QUIET TYPE, FLUSH TOGGLE SWITCH, RATED FOR 20 AMPS, WITH THERMOPLASTIC COVER PLATES.
     1) SINGLE POLE: HUBBELL #CS1221-X, OR EQUAL.
     2) THREE WAY: HUBBELL #CS1223-X, OR EQUAL.
     3) AS SPECIFIED ON PLANS
   - B. RECEPTACLES SHALL BE SPECIFICATION GRADE, DUPLEX, GROUNDING, THREE-WIRE TYPE, RATED FOR 20 AMPS, WITH THERMOPLASTIC COVER PLATES. HUBBELL #CR5352-X, OR EQUAL.
   - C. GROUND FAULT INTERRUPTER RECEPTACLES (GFI) SHALL BE HUBBELL #GF20-XL. DEVICE COVER PLATES SHALL BE AS HEREINBEFORE SPECIFIED.
   - D. ISOLATED GROUND RECEPTACLES (IG) SHALL BE HUBBELL #CR5352IG, ORANGE COLOR. DEVICE COVER PLATES SHALL BE AS HEREINBEFORE SPECIFIED.
   - E. RECEPTACLES OUTSIDE BUILDING AND WHERE NOTED AS WEATHERPROOF, SHALL BE LISTED WEATHER-RESISTANT HUBBEL #5PTR20-X OR EQUAL AND SHALL BE INSTALLED IN A WEATHERPROOF ENCLOSURE WHICH SHALL BE INTERMATIC #WP1010MXD OR #WP1010HMXD DIECAST METAL WEATHERPROOF RECEPTACLE COVER. COVER SHALL BE WEATHER PROOF RATED WHILE IN USE.
   - F. RECEPTACLES(OTHER THAN IG), SWITCHES, AND COVER PLATES SHALL BE BLACK.
9. BOXES:
   - A. HOT DIPPED GALVANIZED STEEL BOXES. PROVIDE TYPE TO SUIT CONDITIONS FOR INSTALLATION.
   - B. ALL BOXES SHALL BE FLUSH MOUNTED, UNLESS INDICATED OTHERWISE.
10. PANELBOARDS:
   - A. FURNISH AND INSTALL CIRCUIT BREAKER PANELBOARDS AS SHOWN ON THE DRAWINGS. PANELBOARDS SHALL BE LISTED BY UL AND SQ LABELED, AND SHALL BE FULLY RATED FOR THE VOLTAGE AND CURRENT CAPACITY INDICATED ON THE PANEL SCHEDULE. PANELBOARDS SHALL BE EQUAL TO SQUARE D TYPE NQ OR NF WITH BOLT IN TYPE BREAKERS. PANELBOARD LUGS SHALL BE RATED AT 75°C.
     1) CIRCUIT BREAKER INTERRUPTING CAPACITIES SHALL MEET OR EXCEED THE AVAILABLE RMS SYMMETRICAL FAULT CURRENTS INDICATED AND AS REQUIRED TO MEET OR EXCEED THE AVAILABLE FAULT CURRENT FROM LOCAL UTILITY.
   - B. CIRCUIT BREAKERS SHALL MEET APPLICABLE PORTIONS OF UL STANDARD 489 AND NEMA AB-1. CIRCUIT BREAKERS SHALL BE BOLT-ON, GROUP MOUNTED, AMBIENT MAGNETIC, WITH COMMON TRIP. UL RATED TO CARRY 80% OF NAMEPLATE RATING CONTINUOUSLY IN FREE AIR AT 40° C. CIRCUIT BREAKERS SHALL BE TRIP INDICATING AND FULLY INTERCHANGEABLE WITHOUT DISTURBING ADJACENT UNITS. WIRE TERMINALS SHALL BE RATED 75 DEGREES C. THE OPERATING MECHANISM SHALL BE TRIP-FREE SO THAT CONTACTS CANNOT BE HELD CLOSED AGAINST ANY ABNORMAL OVERCURRENT OR SHORT CIRCUIT CONDITION.
     a) BREAKERS SHALL MEET APPLICABLE NEMA AND/OR UL SPECIFICATIONS.
   - C. PANELBOARD BOXES SHALL BE GALVANIZED SHEET STEEL WITH AMPLE WIRING GUTTER SPACE IN ACCORDANCE WITH NEC. FRONTS SHALL BE OF SHEET STEEL PAINTED LIGHT GREY OVER A SUITABLE RUST INHIBITOR PRIMER. PANELBOARDS SHALL BE EQUIPPED WITH ONE PIECE DOOR, CYLINDER TUMBLER TYPE LOCK, DIRECTORY CARD-HOLDER AND QUARTER-TURN ADJUSTABLE TRIM CLAMPS.
   - D. PANELBOARD INTERIORS SHALL CONSIST OF REINFORCED GALVANIZED SHEET STEEL FRAMES WITH ALUMINUM BUS BARS AND CIRCUIT BREAKERS, PROPERLY SUPPORTED TO PREVENT VIBRATIONS AND BREAKAGE IN HANDLING. BUS BARS SHALL BE SEQUENCE PHASED. PANELBOARD SHALL HAVE A FULL SIZED SOLID ALUMINUM NEUTRAL AND GROUND BUS.
   - E. BUS BAR BRACING SHALL BE UL LISTED AS INDICATED ON DRAWINGS. ADDITIONAL BRACING SHALL BE PROVIDED AS REQUIRED TO MEET OR EXCEED INDICATED AVAILABLE FAULT CURRENTS.
   - F. DIRECTORY CARDS SHALL BE COMPLETELY FILLED IN BY TYPEWRITER, LISTING CIRCUIT NUMBERS AND LOAD SERVED, INCLUDING EXISTING CIRCUITS. CIRCUIT BREAKERS SHALL BE IDENTIFIED BY CIRCUIT NUMBER LABELS AS HEREINBEFORE SPECIFIED.

ELECTRICAL SPECIFICATIONS (CONTINUED)

11. DISCONNECTS:
   - A. DISCONNECTS SHALL BE EXTERNALLY OPERATED, QUICK-MAKE, QUICK-BREAK, SAFETY, WITH PROVISIONS FOR PAD LOCKING. FUSED AND NON-FUSED DISCONNECT SWITCHES SHALL BE PROVIDED AS INDICATED.
   - B. INDOOR SWITCHES SHALL BE NEMA 1 AND OUTDOOR SWITCHES SHALL BE NEMA 3R, UNLESS INDICATED OTHERWISE.
12. FUSES:
   - A. FUSES PROTECTING CIRCUIT BREAKER PANELS SHALL BE CURRENT LIMITING U.L. CLASS RK-1 FUSES WITH 200,000 AMPERES RMS SYM INTERRUPTING CAPACITY. FUSING ELEMENTS SHALL BE SILVER FOR RATINGS ABOVE 60 AMPERES.
   - B. ALL OTHER FUSES SHALL BE U.L. CLASS RK-5, DUAL-ELEMENT WITH A MINIMUM TIME-DELAY OF 10 SECONDS AT 500% RATING. FUSES SHALL HAVE CURRENT-LIMITING SHORT-CIRCUIT LINKS AND 200,000 AMPERES RMS SYM INTERRUPTING CAPACITY. FUSING ELEMENTS SHALL BE COPPER.
13. LIGHT FIXTURES:
   - A. WHERE LIGHT FIXTURES ARE MOUNTED IN A LAY-IN CEILING, PROVIDE A MINIMUM OF 2 SUPPORT WIRES ATTACHED DIRECTLY BETWEEN EACH LIGHT FIXTURE AND THE BUILDING STRUCTURE. SUPPORT WIRES SHALL BE A MINIMUM OF 12 GAUGE GALVANIZED STEEL WIRE, SOFT ANNEALED.
   - B. FIXTURES ARE REQUIRED AT ALL LIGHTING OUTLETS SHOWN ON THE DRAWINGS. APPROVED LIGHTING FIXTURE WIRE IS REQUIRED IN ALL FIXTURES AND FIXTURE RACEWAYS. WEATHERPROOF WIRING IS REQUIRED FOR EXTERIOR FIXTURES. ALL PARTS OF FIXTURES AND WIRING SHALL BE IN ACCORDANCE WITH NEC REQUIREMENTS.
   - C. ALL FIXTURES SHALL CARRY UL AND ETL LABELS.
14. SLEEVES:
   - A. PROVIDE, SET, AND PROPERLY LOCATE PIPE SLEEVES AS REQUIRED FOR THIS WORK.
   - B. INTERIOR PARTITIONS: 16 GAGE GALVANIZED STEEL, PACK BETWEEN CONDUIT AND SLEEVE WITH FIRE SAFING AND CAULK AT EACH END WITH FIRE RESISTANT SEALANT.
   - C. ROOF: PROSET OR EQUAL, MANUFACTURED PVC SCHEDULE 40 PIPE SLEEVE WITH WEATHERPROOF SEAL. COORDINATE WITH ROOFING CONTRACTOR AND FLASH AS REQUIRED TO MAINTAIN ROOF WARRANTY.
15. GROUNDING:
   - A. GROUND ALL ELECTRICAL APPARATUS IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE (NEC) 250, AND ANY LOCAL REQUIREMENTS. INSURE CONTINUOUS BOND WHERE FLEXIBLE CONDUIT IS USED. PROVIDE BONDING JUMPER INSIDE ALL FLEXIBLE CONDUIT.
   - B. BOND METAL PIPING SYSTEMS IN COMPLIANCE WITH NEC 250.4(A)(4).
16. BOXES IN FIRE RATED ASSEMBLIES:
   - A. OUTLET BOXES THAT DO NOT EXCEED 16 SQUARE INCHES AND INSTALLED IN FIRE RATED WALLS SHALL NOT BE INSTALLED CLOSER THAN 24" HORIZONTAL INCHES TO OTHER OUTLET BOXES.
   - B. IF BOXES MUST BE INSTALLED WITHIN 24" OF EACH OTHER THAN BOTH OUTLET BOXES SHALL BE PROTECTED WITH LISTED PUTTY PADS, 3M FIRE BARRIER MOLDABLE PUTTY + OR EQUAL.
17. FIRE ALARM SYSTEM:
   - A. ELECTRICAL CONTRACTOR SHALL PROVIDE DESIGN BUILD ENGINEERED SHOP DRAWINGS OF FIRE ALARM SYSTEM TO BE INSTALLED. PROVIDE DEVICES, CONDUIT, WIRES, CABLE, PROGRAMMING AND TESTING AS DIRECTED BY EQUIPMENT MANUFACTURER AND LOCAL FIRE DEPARTMENT FOR A CODE COMPLIANT FIRE ALARM/DETECTION SYSTEM. MATERIALS, EQUIPMENT, AND WORKMANSHIP SHALL MEET PREVAILING CODES. THE SYSTEM SHALL BE COMPLETE AND OPERABLE. SUBMIT ONE LINE DIAGRAM OF SYSTEM WITH SIZES AND BATTERY CALCULATIONS. EQUIPMENT TO BE NEW AND SHALL BE STAMPED, SIGNED, CALIBRATION AND TESTED BY FACTORY CERTIFIED TECHNICIAN. FIRE ALARM DEVICES ARE SHOWN FOR INTENT ONLY FOR PERMITTING PROCESS. CONTRACTOR IS RESPONSIBLE FOR INCLUDING IN BID/DESIGN ALL NECESSARY DEVICES (ANNUNCIATOR(S), NOTIFICATION APPLIANCES, INITIATING DEVICES, AND ADDITIONAL COMPONENTS).

ELECTRICAL GENERAL NOTES:

1. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACES AVAILABLE, AND WITHOUT INTERFERENCES.
2. IT IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO PROPERLY BALANCE ALL BRANCH CIRCUITS BETWEEN THE PHASES OF THE SYSTEM REGARDLESS OF CIRCUITING INDICATED.
3. ALL EXPOSED RACEWAYS SHALL BE EMT CONDUIT, MC CABLE IS NOT PERMITTED IN EXPOSED AREAS.
4. ELECTRICAL CONTRACTOR TO COORDINATE MANUFACTURER ELECTRICAL REQUIREMENTS FOR HVAC EQUIPMENT BEING FURNISHED WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. EQUIPMENT DISCONNECTS TO BE PROVIDED BY ELECTRICAL CONTRACTOR UNLESS NOTED OTHERWISE IN MECHANICAL SCHEDULES.
5. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF LIGHT FIXTURES AND DEVICES.
6. REFER TO ARCHITECTURAL & STRUCTURAL DRAWINGS FOR REQUIREMENTS FOR SUPPORTING TRANSFORMERS, EQUIPMENT, ETC. FROM THE STRUCTURE. PROVIDE ADDITIONAL STEEL AS REQUIRED TO PROPERLY SUPPORT SYSTEMS FROM THE STRUCTURE.
7. ALL MATERIALS EXPOSED WITHIN PLENUMS SHALL BE NONCOMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED INDEX OF NOT MORE THAN 50 WHEN TESTED IN ACCORDANCE WITH ASTM E 84.
8. EACH BRANCH CIRCUIT SHALL HAVE A DEDICATED NEUTRAL PER NEC 210.4.
9. FIRE ALARM SYSTEM IS SHOWN FOR SCHEMATIC PURPOSES. THE FIRE ALARM CONTRACTOR IS RESPONSIBLE FOR PROVIDING DESIGN AND SHOP DRAWINGS SUBMITTAL TO FIRE MARSHAL FOR APPROVAL AS REQUIRED BY THE FIRE MARSHAL. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE ADDITIONAL DEVICES, POWER SUPPLIES, ETC FOR COMPLIANCE WITH CODE.
10. ALL BRANCH CIRCUITS SHALL BE SIZED TO ALLOW FOR A MAXIMUM OF 3% VOLTAGE DROP. ALL FEEDERS SHALL BE SIZED TO ALLOW FOR A MAXIMUM OF 2% VOLTAGE DROP. ELECTRICAL CONTRACTOR SHALL VERIFY WIRING INDICATED IS SUFFICIENT AND INCREASE CONDUCTOR SIZE AS REQUIRED BASED OFF ACTUAL INSTALLED LENGTH OF CONDUCTORS.
11. PROVIDE PERMANENT LABEL ON ALL OUTLET COVERS AND POWER DEVICES/DISCONNECTS INDICATING THE PANEL AND BREAKER THEY ARE FED FROM.
12. EMERGENCY DISCONNECT BUTTON AND WIRING FOR THE PROPANE FILL STATION SHALL BE BY E.C.

ELECTRICAL SYMBOLS LIST

CIRCUITING & NOTES	
+46"	SPECIAL MOUNTING HEIGHT FOR ASSOCIATED DEVICE (CENTERLINE OF DEVICE)
GFI	GROUND FAULT CIRCUIT INTERRUPTER DEVICE
WP	WEATHERPROOF ENCLOSURE ON DEVICE
WR	WEATHERPROOF RESISTANT DEVICE
IG	ISOLATED GROUND DEVICE
(TIE)	PARTIAL HOMERUN. REFER TO PLANS FOR ADDITIONAL DEVICES CONNECTED TO THIS CIRCUIT.
X	ELECTRICAL FLOOR PLAN NOTE WITH DESIGNATION
2 LP	CONDUIT CONCEALED WHERE POSSIBLE OR AS NOTED, ARROWS INDICATE HOME RUN TO PANEL. CIRCUIT NUMBERS INDICATED
	#12 WIRE IN CONDUIT, UNLESS NOTED OTHERWISE ON DRAWINGS OR SPECIFICATION
	GROUNDING CONDUCTOR, #12 WIRE UNLESS NOTED OTHERWISE ON DRAWINGS OR SPECIFICATION
	CONDUIT ROUTED UNDER FLOOR/GRADE
LIGHTING	
	EMERGENCY TWIN HEAD LIGHT FIXTURE
	EXIT LIGHT WITH DIRECTIONAL ARROWS INDICATED
A	STRIP FIXTURE WITH TYPE DESIGNATION
A	RECESSED OR SURFACE MOUNTED FIXTURE WITH TYPE DESIGNATION
A N	NIGHT LIGHT, CONNECT TO UNSWITCHED CIRCUIT
A	CEILING OR RECESSED FIXTURE WITH TYPE DESIGNATION
A	WALL MOUNTED FIXTURE WITH TYPE DESIGNATION
POWER DEVICES	
	DUPLEX RECEPTACLE, BOTTOM OF BOX AT 16" AFF, UNLESS NOTED OTHERWISE
	FOURPLEX RECEPTACLE, BOTTOM OF BOX AT 16" AFF, UNLESS NOTED OTHERWISE
	DEVICE MOUNTED ABOVE COUNTER AND/OR SPLASH GUARD
	HEAVY DUTY OUTLET - NEMA CONFIGURATION SIZE PER EQUIPMENT MANUFACTURER'S RECOMMENDATION
	PANEL BOARD, TOP OF BOX 6'-0" AFF
J	JUNCTION BOX
	NON-FUSED DISCONNECT SWITCH
	FUSED DISCONNECT SWITCH
	MOTOR WITH DESIGNATION
CONTROLS	
S	SINGLE POLE WALL SWITCH, TOP OF BOX AT 48" AFF
S_2	TWO POLE WALL SWITCH, TOP OF BOX AT 48" AFF
S_3	THREE-WAY WALL SWITCH, TOP OF BOX AT 48" AFF
S_m	MANUAL MOTOR STARTER WITH OVERLOADS
S_O	INFRARED OCCUPANCY SENSOR, WATT STOPPER #PW-100, TOP OF BOX AT 48" AFF
PC	INTERMATIC #EK4136S, STEM MOUNT PHOTOCELL, UNIVERSAL VOLTAGE, LOCATED ON ROOF IN SHADED AREA FACING NORTH
COMMUNICATIONS	
	DATA/TELEPHONE OUTLET - (X) NUMBER IN PARENTHESES INDICATES NUMBER OF CAT5E CABLES TO BE PULLED TO LOCATION FROM PATCH PANEL LOCATED NEAR DEMARC. ALL TERMINATIONS AND PORT WALL JACK BY OTHERS. COORDINATE LOCATIONS AND QUANTITIES WITH WESTLAKE PRIOR TO WORK. V=VOICE, D=DATA, A=ALARM
FIRE ALARM	
SD	CEILING MOUNT SMOKE DETECTOR
FSD	DUCT MOUNT SMOKE DETECTOR
F	FIRE ALARM PULL STATION, TOP OF BOX AT 48" AFF
B	EXTERIOR FIRE ALARM BELL, CENTERLINE 11'-8" ABOVE GRADE
WF	WATER FLOW SWITCH
TS	TAMPER SWITCH
MISCELLANEOUS	
	120 - 24 VOLT INDUSTRIAL CONTROL TRANSFORMER 50 VA VA MINIMUM W/ CIRCUIT BREAKER (MANUAL RESET) FOR ALL VAV BOXES AND BYPASS DAMPERS, VERIFY EXACT REQUIREMENTS WITH MECHANICAL UNITS BEING SUPPLIED
	PUSH BUTTON, TOP OF BOX AT 48" UNLESS NOTED OTHERWISE

LIGHT FIXTURE SCHEDULE

MARK NO.	MANUFACTURER & CATALOG NUMBER	VOLTS WATTS	LAMPS	DESCRIPTION	EQUIVALENT MANUFACTURERS
A	LITHONIA 2GTL-4-48L-EZ1-LP840	120 47	LED 4000K 4800 LUMS	2'X4' GRID LAY-IN LED FIXTURE WITH ACRYLIC LENS.	OR EQUAL AS APPROVED BY WESTLAKE
B	LSI RD-200-100-INC-120-MSV-CA120BLK	120 14	LED EQUIVALENT A19	16"Ø PENDANT WITH METAL SILVER PENDANT. 10' PRE-WIRED BLACK CORED SET AND CANOPY. MEDIUM BASE SOCKET FOR 100W EQUIVALENT LED LAMP. MOUNT AT 8'-0" AFF TO BOTTOM OF FIXTURE	OR EQUAL AS APPROVED BY WESTLAKE
C4	LITHONIA ZL1N-L48-5000LM-FST-MVOLT-40K-80CRI- WH	120 38	LED 4000K 5000 LUMS	4' LED STRIP WITH SNAP ON FROSTED DIFFUSER AND WHITE FINISH. MOUNT AT 14'-0" AFF TO BOTTOM OF FIXTURE	OR EQUAL AS APPROVED BY WESTLAKE
C8	LITHONIA TZL1N-L96-10000LM-FST-MVOLT-40K-80CRI-WH	120 76	LED 4000K 10000 LUMS	8' LED STRIP WITH SNAP ON FROSTED DIFFUSER AND WHITE FINISH. MOUNT AT 14'-0" AFF TO BOTTOM OF FIXTURE	OR EQUAL AS APPROVED BY WESTLAKE
D	ABOLITE AD200-INC-120-GBK-LDS96WS W/ GB-P-3-GBK ARM/WALL BRACKET	120 30	1-30W LED SATCO #529150	DECORATIVE GOOSE NECK FIXTURE TO BE USED AS SIGN LIGHTERS W/ 41" ARM. MEDIUM BASE FOR LED MULTI BEAM LAMP. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION.	OR EQUAL AS APPROVED BY WESTLAKE
D2	ABOLITE AD200-INC-120-GBK-LDS96WS W/ GB-A-3-GBK ARM/WALL BRACKET	120 30	1-30W LED SATCO #529150	SAME AS FIXTURE D EXCEPT FOR W/ 25" ARM.	OR EQUAL AS APPROVED BY WESTLAKE
F	CREE CPY250-C-13L-57K7-D-UL-DM-WH	120 86	LED 5700K 13000 LUMS	DIRECT MOUNTED LED CANOPY LIGHT WITH DROPPED LENS AND WHITE FINISH.	OR EQUAL AS APPROVED BY WESTLAKE
G1	BEACON LIGHTING TRV-D-24NB-55-5K-T4-UNV-GYS	120 55	LED 5000K 6000 LUMS	WALL MOUNTED LED FULL CUTOFF FIXTURE WITH GRAY SMOOTH FINISH. TYPE 4 DISTRIBUTION MOUNT FIXTURE AT +15'-0"	OR EQUAL AS APPROVED BY WESTLAKE
G2	BEACON LIGHTING TRV-D-36NB-80-5K-T4-UNV-GYS	120 80	LED 5000K 9000 LUMS	WALL MOUNTED LED FULL CUTOFF FIXTURE WITH GRAY SMOOTH FINISH. TYPE 4 DISTRIBUTION MOUNT FIXTURE AT +15'-0"	OR EQUAL AS APPROVED BY WESTLAKE
H	LITHONIA FEM-L96-15000LUM-IMAFL-WD-MVOLT-6Z10-50K-80CRI	120 95	LED 5000K 15000 LUMS	8' WET LOCATION ENCLOSED AND GASKETED FIXTURE WITH FROSTED LENS. REFER TO EXHIBIT C FOR MOUNTING.	OR EQUAL AS APPROVED BY WESTLAKE
S5	BEACON LIGHTING VP-L-96L-330-5K7-5R-UNV-A-BL W/ SS5-B-25-40-A-1-B3-BLT POLE	208 220	LED 5000K 25000 LUMS	FLAT LENS LED POLE LIGHT, TYPE V DISTRIBUTION, 5000°K, MOUNT ON 25' SQUARE STEEL POLE ON 2' CONCRETE POLE BASE. BLACK FINISH. MAX FIXTURE HEIGHT SHALL BE 27' PER CITY ORDINANCE.	OR EQUAL AS APPROVED BY WESTLAKE
	DUAL-LITE EV4D-02L	120 2	INCL	EMERGENCY LIGHT WITH TWIN ADJUSTABLE 2 WATT LED HEADS AND SEALED LEAD CALCIUM BATTERY, MOUNT AT 7'-6"±, TO CLEAR OBSTACLES. (PROVIDES 1 FC AVG. ON 39' CENTER FIXTURE SPACING) DAMP LOCATION RATED.	SURE-LITES LITHONIA OR EQUAL
	DUAL-LITE EVC-U-R-W	120 3	INCL	COMBINATION EMERGENCY/EXIT LIGHT WITH LED LAMPS, RED LETTERS ON WHITE BACKGROUND, TWIN LED EMERGENCY LIGHT HEADS, UNIVERSAL MOUNT, BATTERY BACKUP	SURE-LITES LITHONIA OR EQUAL
	DUAL-LITE EVC-U-R-W-D4 WITH EVO-D-X	120 5	INCL	COMBINATION EMERGENCY/EXIT LIGHT WITH LED LAMPS, RED LETTERS ON WHITE BACKGROUND, TWIN 6W EMERGENCY LIGHT HEADS, UNIVERSAL MOUNT, HIGH CAPACITY BATTERY BACKUP AND REMOTE TWIN HEAD OUTDOOR RATED FIXTURE	SURE-LITES LITHONIA OR EQUAL

NOTES:

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.6360
fax: 913.451.6361
www.davidsonae.com

2/24/2023

STATE OF MISSOURI
BRETT M. HERMANN
NUMBER PE-2018035615
PROFESSIONAL ENGINEER

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

date 02.24.2023
drawn by SK/BH
checked by BQ/DS
revisions △

BC PROJECT #: 22784
MISSOURI PE COA #2009003629

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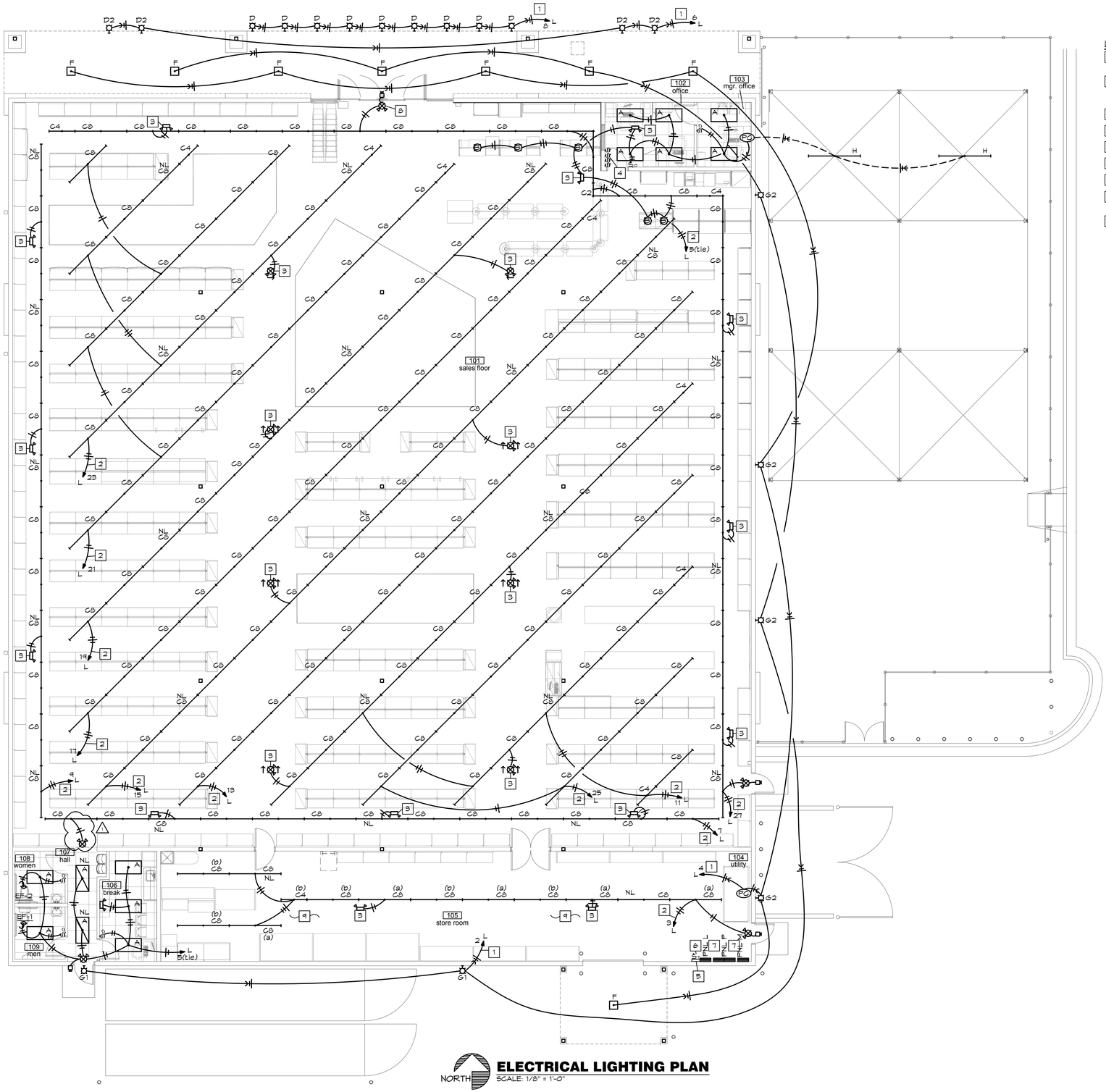

NORTH

ELECTRICAL LIGHTING PLAN

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

LIGHTING PLAN NOTES:

1. ROUTE CIRCUIT TO PANEL VIA EXTERIOR LIGHTING CONTROLS LOCATED ADJACENT TO PANEL L. SEE DETAIL ON SHEET E3.0.
2. ROUTE SWITCHED LEG OF CIRCUIT THROUGH INTERIOR LIGHTING CONTROLS LOCATED ADJACENT TO PANEL L. PROVIDE UNSWITCHED "HOT" CONDUCTOR ROUTED AHEAD OF LIGHTING CONTROLS FOR EXIT, EMERGENCY AND NIGHT-LIGHTS. SEE DETAIL ON SHEET E3.0.
3. EXIT/EMERGENCY LIGHT TO BE CEILING MOUNTED/ SUSPENDED AT +14'-0" AFF.
4. MASTER SWITCHES FOR SALES AREA LIGHTS. SEE LIGHTING CONTROL DETAIL ON SHEET E3.0.
5. PROPOSED LOCATION OF LIGHTING CONTROLS. SEE DETAILS ON SHEET E3.0.
6. PROPOSED LOCATION OF SPRING WOUND TIMER FOR INTERIOR LIGHTING CONTROLS. SEE DETAIL ON THIS SHEET.
7. 3'-0" CLEARANCE TO BE MAINTAINED IN FRONT OF ELECTRICAL PANELS.
8. EXIT/EMERGENCY LIGHT ABOVE ENTRY SLIDING DOOR SHALL BE CENTER IN-BETWEEN THE TRANSOM GLASS AREA ABOVE THE MECHANICAL HEADER. COORDINATE EXACT LOCATION WITH PROJECT MANAGER.
9. MOUNT LIGHTS IN STORE ROOM TIGHT TO BOTTOM OF BAR JOIST.

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5720 Reeder Shawnee, Ks. 66203 (913)262-1772

davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.6360
fax: 913.451.6361
www.davidsonae.com

3/15/2023

STATE OF MISSOURI
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REGISTERED PROFESSIONAL ENGINEER

a new store for Westlake ACE Hardware

3511 SW Market Street
Lee's Summit, Missouri 64082

date 02.24.2023
drawn by SK/BH
checked by BQ/DS
revisions 03.15.23

sheet number
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project number 22185

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davidson
architecture&engineering
4301 Indian Creek Parkway
Overland Park, KS 66207
phone: 913.451.8330
fax: 913.451.8391
www.davidsonaa.com

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BRETT M. HERMANN
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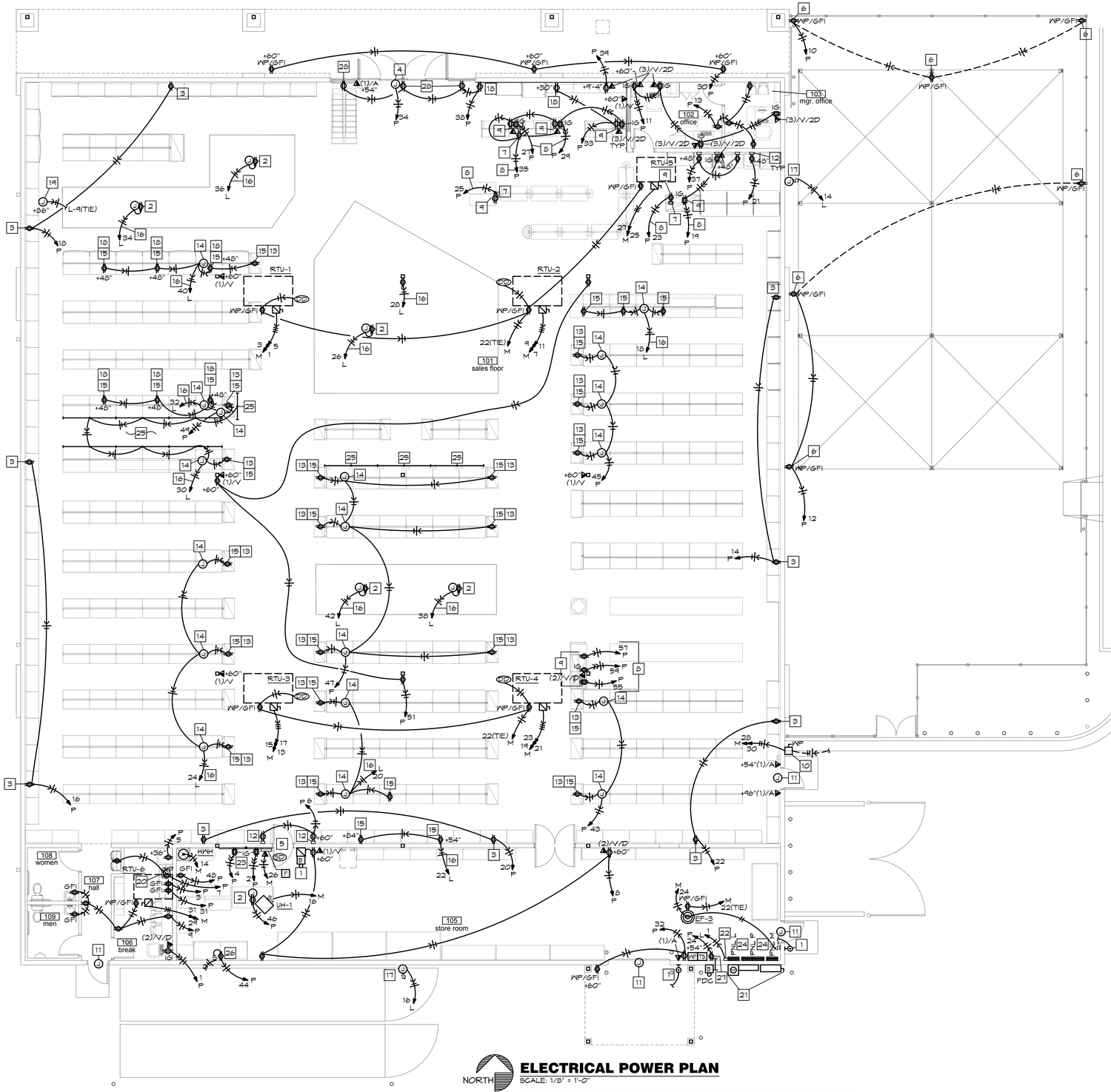

ELECTRICAL POWER PLAN

NORTH

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

PROVIDE 15 CAT5e CABLE RUNS FROM MANAGERS OFFICE FOR CAMERA SYSTEM AS INSTRUCTED BY WESTLAKE. VERIFY EXACT LOCATION OF ALL CAMERA/EQUIPMENT PRIOR TO WORK.

LIGHTING PLAN NOTES:

1. PROVIDE PUSH BUTTON AT +48" AFF AT THE EXTERIOR OF RECEIVING MAN DOOR. PROVIDE LV TRANSFORMER AND BUZZER +85" AFF AT THE SALES SIDE OF THE DOOR BETWEEN SALES AND STORE ROOM. MAKE CONNECTIONS TO ALL COMPONENTS PER MANUFACTURERS INSTRUCTIONS FOR COMPLETE SYSTEM.
2. DUPLEX RECEPTACLE TO BE MOUNTED IN JUNCTION BOX AT THE CEILING STRUCTURE. VERIFY EXACT LOCATION.
3. COORDINATE EXACT LOCATION OF RECEPTACLES IN EXTERIOR WALLS OF SALES FLOOR.
4. PROVIDE CONNECTION FOR AUTOMATIC DOOR OPERATOR PER MANUFACTURERS INSTRUCTIONS. COORDINATE EXACT LOCATIONS AND ELECTRICAL REQUIREMENTS PRIOR TO ROUGH IN.
5. FIRE ALARM CONTROL PANEL.
6. COORDINATE EXACT MOUNTING, LOCATION, AND ROUTING FOR RECEPTACLES IN GARDEN CENTER AREA.
7. PROVIDE POWER POLE WITH POWER AND DATA PROVISIONS. COORDINATE EXACT LOCATION PRIOR TO INSTALLATION. ROUTE WIRE/CONDUIT TO DEVICES IN CASEWORK CONCEALED. POWER POLES TO BE LEGRAND WIREMOLD #25DTP-415 GRAY FINISH OR EQUAL. COORDINATE WITH WESTLAKE PRIOR TO ORDERING.
8. ROUTE CIRCUIT TO PANEL INDICATED VIA POWER POLE(NOTE 7, THIS SHEET) OR COLUMN IF APPLICABLE.
9. COORDINATE EXACT LOCATION OF DEVICES TO BE MOUNTED IN CASEWORK. ROUTE WIRE/CONDUIT FROM DEVICES TO POWER POLE/WALL/COLUMN IN CASEWORK CONCEALED.
10. EMERGENCY DISCONNECT W/ PUSH BUTTON FOR PROPANE FILLING STATION. DIRECT WIRE TO PUMP ENCLOSURE. VERIFY EXACT LOCATION OF DISCONNECT AND PUMP ENCLOSURE. ALL CONDUITS AND FITTINGS SHALL BE EXPLOSION PROOF. PROVIDE SEAL OFFS FOR CONDUITS ENTERING/LEAVING CLASSIFIED AREA PER NEC 501 AND 514. ALL WORK IN PROPANE FILLING AREA SHALL MEET REQUIREMENTS OF NEC 501 FOR CLASS 1, DIV 1 HAZARDOUS LOCATIONS.
11. PROVIDE PROVISIONS AND CONNECT TO DELAY EXIT AND ALARM COMPONENTS AT DOORS INDICATED PER MANUFACTURERS INSTRUCTIONS. PROVIDE 120V POWER FROM GENERAL RECEPTACLE CIRCUIT IN THE AREA WITH 2#12AWG, 1#12G, IN 3/4"C AS REQUIRED.
12. DEVICE TO HAVE 2-3/4" EXTENSION RING FOR SHELF CUT IN.
13. DEVICE TO BE SURFACE MOUNTED ON RACKING/CASEWORK. LIMIT EXPOSED CONDUIT AS MUCH AS POSSIBLE
14. PROVIDE JUNCTION BOX MOUNTED AT CEILING ABOVE RACKING. DROP CONDUIT TO TOP OF RACKING. BEND 90° ALONG TOP OF RACKING STRAPPING TO TOP CAP AS REQUIRED. MOUNT 1" STEEL HANDY BOX WITH RECEPTACLE MOUNTED FACE UP AT DESIRED LOCATION. IF A GONDOLA HAS A RECEPTACLES MOUNTED BOTH DIRECTIONS FOR CONDUIT DROP A JUNCTION BOX CAN BE MOUNTED ON TOP OF THE RACKING IN LIEU OF THE CONDUIT BEND. VERIFY EXACT LOCATION OF DROPS.
15. DEVICE TO BE MOUNTED IN RACKING VERIFY EXACT LOCATION WITH WESTLAKE PRIOR TO INSTALLATION. RECEPTACLES ON GONDOLAS SHALL BE IN HANDI-BOXES WITH GALVANIZED COVERS.
16. ROUTE CIRCUIT TO PANEL VIA INTERIOR LIGHTING CONTROLS LOCATED ADJACENT TO PANEL L. SEE DETAIL ON SHEET E3.0. PROVIDE EXTRA UNSWITCHED CONDUCTOR FOR RECEPTACLE MOUNTED AT END OF RACKING AS INDICATED.
17. PROVIDE WEATHER PROOF JUNCTION BOX WITH DISCONNECTING MEANS LOCTAED AT INTERIOR AND STUB CONDUIT OUT TO EXTERIOR FOR BUILDING MOUNTED SIGNAGE. MAKE CONNECTION TO SIGNAGE PER MANUFACTURERS INSTRUCTIONS. ROUTE CIRCUIT TO PANEL INDICATED VIA EXTERIOR LIGHTING CONTROLS. SEE DETAIL ON SHEET E3.0 FOR MORE INFORMATION.
18. WALL WHIP AT 24" AFF WITH DUPLEX RECEPTACLE IN STRAP TYPE BOX (RACO 237 W/ 771 COVER)
19. JUNCTION BOX MOUNTED 86" AFF FOR POWER TO ILLUMINATED VALENCE AT YETI COOLER DISPLAY. CONNECT TO SWITCHED LIGHTING CIRCUIT INDICATED. VERIFY EXACT LOCATION
20. PROVIDE SWITCHED RECEPTACLE IN CABINET BELOW SINK FOR DISPOSAL. VERIFY EXACT LOCATION
21. PROPOSED LOCATION SERVICE ENTRANCE ELECTRICAL GEAR. SEE RISER DIAGRAM ON SHEET E3.0.
22. PROPOSED LOCATION OF LIGHTING CONTROLS. SEE DETAILS ON SHEET E3.0.
23. 8' FIRE-RETARDANT PLYWOOD TELEPHONE BACKBOARD WITH SIEMENS #ECGB-5 GROUND BAR AND #6 CU BOND TO BUILDING ELECTRODE SYSTEM. PROVIDE (2) 4"C WITH PULL STRING TO PROPERTY LINE AS DIRECTED BY TELEPHONE/CABLE PROVIDER. FIRE RETARDANT BACKING AND SHEATHING IS REQUIRED THROUGHOUT TO COMPLY WITH CONSTRUCTION TYPE IIB.
24. 3'-0" CLEARANCE TO BE MAINTAINED IN FRONT OF ELECTRICAL PANELS.
25. 4'/8' LED STRIPS PROVIDED BY OWNER TO BE INSTALLED AND POWERED FROM GONDOLA RECEPTACLES. VERIFY EXACT LOCATION.
26. DUPLEX RECEPTACLE ON DEDICATED CIRCUIT FOR CONNECTION TO STIHL WORKBENCH. PROVIDE SWITCH FOR CONTROL OF LED STRIP LIGHTING PROVIDED BY OTHERS TO BE INSTALLED AFTER WORKBENCH SHELVING.
27. PROVIDE POWER TO IRRIGATION CONTROLLER PER MANUFACTURERS INSTRUCTIONS. PROVIDE 1"C STUBBED TO AS DIRECTED BY PROVIDER. VERIFY EXACT LOCATION AND REQUIREMENTS.
28. DUPLEX RECEPTACLE TO BE MOUNTED JUST ABOVE TRANSOM GLASS AT +120" AFF. VERIFY EXACT LOCATION.

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davidson
architecture&engineering
4301 Indian Creek Parkway
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fax: 913.451.6361
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2/24/2023

STATE OF MISSOURI
BRETT M. HERMANN
NUMBER PE-2018035615
REGISTERED PROFESSIONAL ENGINEER

PANEL: M	VOLTS: 120/208V	PH: 3Ø	WIRE: 4W	LOCATION: EAST WALL OF BOH	MOUNTING: SURFACE
BUS: 600A	MAIN: 600A MLO	IC: 22,000	RMS SYM AMPS		FEEDER: SEE RISER DIAGRAM

CKT	DESCRIPTION	AMPS	POLE	WIRE	ØA	ØB	ØC	ØA	ØB	ØC	WIRE	POLE	AMPS	DESCRIPTION	CKT NO
1	RTU-1	70	3	4	6,480			13,800							2
3						6,480			11,880		3/0	3	200	PANEL P	4
5							6,480			12,040					6
7	RTU-2	70	3	4	6,480			12,480							8
9						6,480			15,193		3/0	3	200	PANEL L	10
11							6,480			14,103					12
13	RTU-3	60	3	4	5,760			1,500			8	1	20	WATER HEATER [HL]	14
15						5,760			500		12	1	20	UH-1	16
17							5,760					1	20	SPARE	18
19	RTU-4	60	3	6	5,760							1	20	SPARE	20
21						5,760		1,080			8	1	20	ROOF RECEPTS	22
23							5,760			500	12	1	20	EF-3	24
25	RTU-5	25	2	8	2,004			500			12	1	20	FACP [HL]	26
27						2,004			2,500		8	2	30	PROPANE FILLING STATION	28
29	RTU-6	25	2	10			2,004			2,500					30
31					2,004							1	20	SPARE	32
33	SPARE	20	1									1	20	SPARE	34
35	SPARE	20	1									1	20	SPARE	36
37	SPARE	20	1									1	20	BUSSED SPACE	38
39	SPARE	20	1									1	20	BUSSED SPACE	40
41	SPARE	20	1									1	20	BUSSED SPACE	42
NOTES:					28,488	28,484	28,484	28,280	31,193	29,143					
[HL]-HANDLE LOCK					56,768		57,637		55,627						

TOTAL CONNECTED LOAD:	170,032 VA
NEC DEMAND LOAD:	169,436 VA
DEMAND AMPS @ 208 VOLT / 3Ø:	470.31 A

PANEL: L	VOLTS: 120/208V	PH: 3Ø	WIRE: 4W	LOCATION: EAST WALL OF BOH	MOUNTING: SURFACE
BUS: 225A	MAIN: 200A MLO	IC: 22,000	RMS SYM AMPS		FEEDER: SEE RISER DIAGRAM

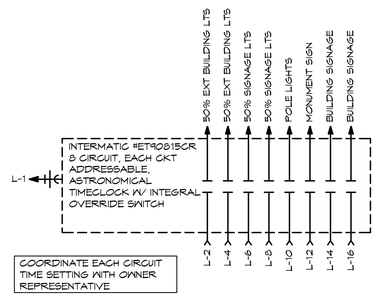
CKT	DESCRIPTION	AMPS	POLE	WIRE	ØA	ØB	ØC	ØA	ØB	ØC	WIRE	POLE	AMPS	DESCRIPTION	CKT NO
1	LIGHTING CONTROLS	20	1	12	500			608			10	1	20	50% EXT BUILDING LTS	2
3	BOH LIGHTS	20	1	12		1,596			653		12	1	20	50% EXT BUILDING LTS	4
5	FRONT/OFF/RR/BRK LTS	20	1	8			1,541			240	12	1	20	50% SIGNAGE LTS	6
7	BACK SALES LTS	20	1	12	450			270			12	1	20	50% SIGNAGE LTS	8
9	WEST SALES LTS	20	1	10		1,028			880		8	1	20	POLE LIGHTS	10
11	SALES LTS	20	1	8			1,482			1,200	8	1	20	MONUMENT SIGN	12
13	SALES LTS	20	1	10	1,064			1,200			8	1	20	BUILDING SIGNAGE	14
15	SALES LTS	20	1	8		1,216			1,200		8	1	20	BUILDING SIGNAGE	16
17	SALES LTS	20	1	8			1,102			1,500	8	1	20	DISPLAY LIGHTING	18
19	SALES LTS	20	1	10	988			1,500			8	1	20	DISPLAY LIGHTING	20
21	SALES LTS	20	1	8		1,482			1,500		8	1	20	DISPLAY LIGHTING	22
23	SALES LTS	20	1	8			988			1,500	8	1	20	DISPLAY LIGHTING	24
25	SALES LTS	20	1	12	900			1,500			8	1	20	DISPLAY LIGHTING	26
27	EAST SALES LTS	20	1	12		1,140			1,500		8	1	20	DISPLAY LIGHTING	28
29	SPARE	20	1							1,500	8	1	20	DISPLAY LIGHTING	30
31	SPARE	20	1					1,500			8	1	20	DISPLAY LIGHTING	32
33	SPARE	20	1						1,500		8	1	20	DISPLAY LIGHTING	34
35	SPARE	20	1							1,500	8	1	20	DISPLAY LIGHTING	36
37	BUSSED SPACE							1,500			8	1	20	DISPLAY LIGHTING	38
39	BUSSED SPACE								1,500		8	1	20	DISPLAY LIGHTING	40
41	BUSSED SPACE									1,500	8	1	20	DISPLAY LIGHTING	42
NOTES:					4,402	6,460	5,163	8,078	8,733	8,940					
					12,480		15,193		14,103						

TOTAL CONNECTED LOAD:	41,776 VA
NEC DEMAND LOAD:	52,095 VA
DEMAND AMPS @ 208 VOLT / 3Ø:	144.60 A

PANEL: P	VOLTS: 120/208V	PH: 3Ø	WIRE: 4W	LOCATION: EAST WALL OF BOH	MOUNTING: SURFACE
BUS: 225A	MAIN: 200A MLO	IC: 22,000	RMS SYM AMPS		FEEDER: SEE RISER DIAGRAM

CKT	DESCRIPTION	AMPS	POLE	WIRE	ØA	ØB	ØC	ØA	ØB	ØC	WIRE	POLE	AMPS	DESCRIPTION	CKT NO
1	BREAK DESK RECS	20	1	12	360			1,000			12	1	20	PHONE BOARD	2
3	BREAK COUNTER [GFI]	20	1	10		1,000			1,000		12	1	20	PHONE BOARD	4
5	BREAK REF [GFI]	20	1	8			1,200			500	12	1	20	SALES AREA RECS	6
7	BREAK DISP/ENG [GFI]	20	1	10	1,000			1,080			12	1	20	STORE ROOM/EXT RECS	8
9	RESTROOM/HALL/ROOF RECS	20	1	8		1,080			360		12	1	20	GARDEN CENTER EXT RECS	10
11	OFFICE IG RECS	20	1	8			1,260			540	10	1	20	GARDEN CENTER EXT RECS	12
13	OFFICE RECS	20	1	10	720			800			12	1	20	SALES WALL RECS	14
15	SPARE	20	1						800		10	1	20	SALES WALL RECS	16
17	SPARE	20	1							800	6	1	20	SALES WALL RECS	18
19	PAINT MIXING IG RECS	20	1	6	1,200			800			12	1	20	SALES WALL RECS	20
21	PAINT MIXING RECS	20	1	12		400			800		12	1	20	SALES WALL RECS	22
23	PAINT MIXING REC	20	1	12			400			500	12	1	20	IRRIGATION CONTROLS	24
25	IMPULSE REC	20	1	10	500							1	20	SPARE	26
27	RESISTER IG QUAD	20	1	10		500						1	20	SPARE	28
29	RESISTER IG QUADS	20	1	8			1,000			540	10	1	20	FRONT EXT RECS	30
31	BREAK COUNTER	20	1	10	1,000			500			12	1	20	DOCK LIGHT	32
33	RESISTER AREA RECS	20	1	8		1,000			1,200		6	1	20	FRONT AUTOMATIC DOOR	34
35	RESISTER AREA RECS	20	1	8			1,000					1	20	SPARE	36
37	PAINT MIXING REC	20	1	10	800			720			10	1	20	WINDOW SIGNAGE RECS	38
39	REGISTER MONITOR REC	20	1	10		500						1	20	SPARE	40
41	SPARE	20	1							1,200	12	1	20	OVERHEAD DOOR	42
	SECTION 2														
43	GONDOLA RECS	20	1	12	800			1,000			12	1	20	WORK BENCH	44
45	GONDOLA RECS	20	1	8		1,200			1,000		10	1	20	WORK BENCH	46
47	GONDOLA RECS	20	1	10			800			1,800	6	1	20	FLOOR MACHINE CHARGER	48
49	GONDOLA RECS	20	1	8	800							1	20	SPARE	50
51	COLUMN RECS	20	1	12		540						1	20	SPARE	52
53	SPARE	20	1									1	20	SPARE	54
55	SERVICE COUNTER RECS	20	1	10	720							1	20	SPARE	56
57	SERVICE COUNTER REC	20	1	12		500						1	20	SPARE	58
59	SERVICE COUNTER IG RECS	20	1	12			500					1	20	SPARE	60
61	SPARE	20	1									1	20	SPARE	62
63	SPARE	20	1									1	20	SPARE	64
65	SPARE	20	1									1	20	SPARE	66
67	BUSSED SPACE													BUSSED SPACE	68
69	BUSSED SPACE													BUSSED SPACE	70
71	BUSSED SPACE													BUSSED SPACE	72
73	BUSSED SPACE													BUSSED SPACE	74
75	BUSSED SPACE													BUSSED SPACE	76
77	BUSSED SPACE													BUSSED SPACE	78
79	BUSSED SPACE													BUSSED SPACE	80
81	BUSSED SPACE													BUSSED SPACE	82
83	BUSSED SPACE													BUSSED SPACE	84
NOTES:					7,900	6,720	6,160	5,900	5,160	5,880					
[GFI]-GFCI BRKR					13,800		11,880		12,040						
ISOLATED GROUND BUS															

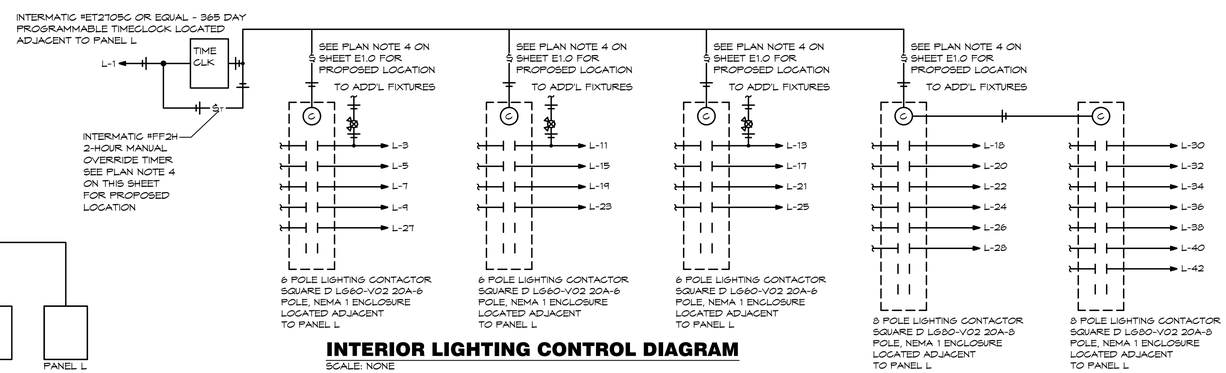
TOTAL CONNECTED LOAD:	37,720 VA
NEC DEMAND LOAD:	27,470 VA
DEMAND AMPS @ 208 VOLT / 3Ø:	76.25 A



COORDINATE EACH CIRCUIT TIME SETTING WITH OWNER REPRESENTATIVE

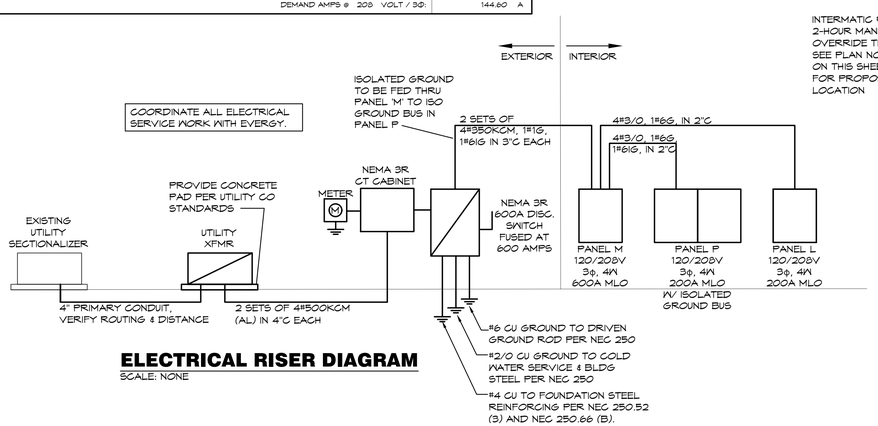
EXTERIOR LIGHTS/SIGNAGE CONTROL DIAGRAM

SCALE: NONE



INTERIOR LIGHTING CONTROL DIAGRAM

SCALE: NONE



COORDINATE ALL ELECTRICAL SERVICE WORK WITH EVERGY.

ELECTRICAL RISER DIAGRAM

SCALE: NONE

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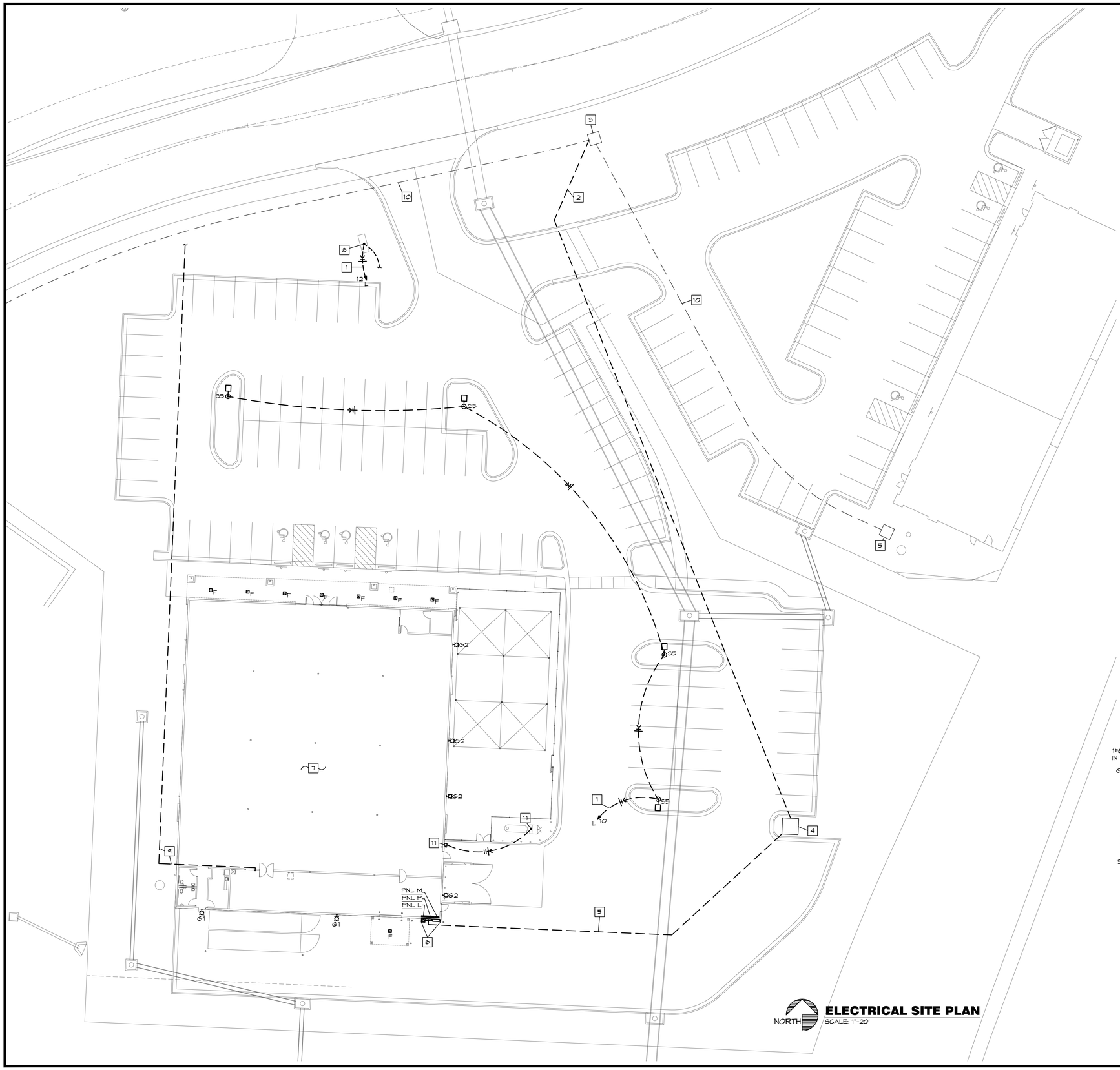
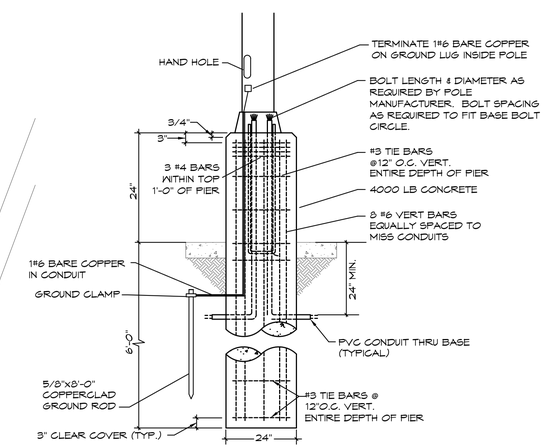


NORTH

ELECTRICAL SITE PLAN
SCALE: 1"=20'

ELECTRICAL SITE PLAN NOTES:

1. ROUTE CIRCUIT TO PANEL VIA EXTERIOR LIGHTING CONTROLS LOCATED ADJACENT TO PANEL L. SEE DETAIL ON SHEET E3.0.
2. ELECTRICAL PRIMARY. REFER TO RISER DIAGRAM ON SHEET E3.0 FOR MORE INFORMATION.
3. APPROXIMATE LOCATION OF EXISTING UTILITY SECTIONALIZER.
4. PROPOSED LOCATION OF UTILITY TRANSFORMER. REFER TO RISER DIAGRAM ON SHEET E3.0 FOR MORE INFORMATION.
5. APPROXIMATE LOCATION OF EXISTING TRANSFORMER FOR ADJACENT PROPERTY.
6. APPROXIMATE LOCATION OF SERVICE ENTRANCE ELECTRICAL GEAR. REFER TO RISER DIAGRAM ON SHEET E3.0 FOR MORE INFORMATION.
7. CIRCUITING FOR BUILDING MOUNTED LIGHTS SHOWN ON SHEET E1.0.
8. MONUMENT SIGN: MAKE CONNECTION PER MANUFACTURERS INSTRUCTIONS. IN ADDITION TO POWER PROVIDE 1" CONDUIT WITH PULL STRING TO PHONE BOARD.
9. (2) 4"C WITH PULL STRINGS FROM TELEPHONE BOARD(NOTE 6 ON SHEET E3.0) TO PROPERTY LINE AS DIRECTED BY TELEPHONE/CABLE PROVIDER.
10. EXISTING ELECTRICAL PRIMARY TO REMAIN.
11. EMERGENCY DISCONNECT FOR PROPANE FILLING STATION. DIRECT WIRE TO PUMP ENCLOSURE. VERIFY EXACT LOCATION OF DISCONNECT AND PUMP ENCLOSURE. ALL CONDUITS AND FITTINGS SHALL BE EXPLOSION PROOF. PROVIDE SEAL OFFS FOR CONDUITS ENTERING/LEAVING CLASSIFIED AREA PER NEC 501 AND 514. ALL WORK IN PROPANE FILLING AREA SHALL MEET REQUIREMENTS OF NEC 501 FOR CLASS 1, DIV 1 HAZARDOUS LOCATIONS. SEE PLAN NOTE 10 ON SHEET E2.0 FOR MORE INFORMATION. PROVIDE ADDITIONAL 1"C FOR LV CABLES AS REQUIRED. INSTALL COMPLETE PER MANUFACTURERS INSTRUCTIONS



POLE FOUNDATION DETAIL
SCALE: NONE

BC PROJECT #: 22784
MISSOURI PE COA #2009003629

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BC ENGINEERS INCORPORATED
5720 Reeder Shawnee, Ks. 66203 (913)262-1772

a new store for
Westlake ACE Hardware
3511 SW Market Street
Lee's Summit, Missouri 64082

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