Joe Frogge

RELEASED FOR CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
06/23/2022

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architecture & engineering

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project description:

New pre-engineered metal building for indoor batting cages with support office, retail, and party room.

submittal dates:

sitework:	spring 2022
building envelope:	summer 2022
occupancy:	fall/winter 2022
estimated duration:	9 months

schedule indications are estimated and shall be the responsibility of the contractor.

const. schedule

PDP & Rezoning submittal:	approved January 2022
planning approval:	pending approval
permit submittal:	May 2022
permit approval:	pending review

project synopsis:

governing municipality: Lee's Summit, Missouri
governing code:
2018 International Building Code
2018 International Plumbing Code
2018 International Mechanical Code
2018 International Fuel Gas Code
2018 International Residential Code
2018 International Fire Code
2017 National Electrical Code
ICC/ANSI A117.1-2009, Accessible and Usable Buildings and Facilities
Lee's Summit Municipal Code

zoning: PI

construction: 1 VB, pemb

stories: one + mezzanine

building height: 27'-0" max.

fire suppression: yes

bldg footprint: 19,800 s.f.

occupancy group: A-3 (indoor sports) with B+M (office mercantile accessory)

occupant load: 213
first floor accessory spaces: 44
mezzanine: 73
batting cages: 96

*reference code plan and code review

sheet index:

owner:

WHD Management LLC
PO Box 1059
Lee's Summit, MO 64063
P: 816.246.3987

architect:

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Davidson Architecture & Engineering
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structural engineer:

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Apex Engineers, Inc.
1625 Locust St.
Kansas City, MO 64108
p: 816.421.3222

mp engineer:

Maxwell T. Apple
BC Engineers
5720 Reeder Shawnee, KS 66203
p: 913.262.1772

electrical engineer:

Darin T. Seidel
BC Engineers
5720 Reeder Shawnee, KS 66203
p: 913.262.1772

STATE OF MISSOURI
CHRISTOPHER LEE HAFNER
NUMBER A-2012020152
ARCHITECT
06.20.2022

a new development for
D-BAT - Town Centre Lot 1
540 NE Town Centre Drive, Lee's Summit, Missouri

A0.0
cover sheet

project synopsis

Municipality:	Lee's Summit, Missouri
Applicable Building Codes & Ordinances:	2018 International Building Code (IBC) 2018 International Plumbing Code (IPC) 2018 International Mechanical Code (IMC) 2018 International Fuel Gas Code (IFGC) 2018 International Fire Code (IFC) 2017 National Electrical Code (NEC) ICC/ANSI A117.1-2009, Accessible and Usable Buildings and Facilities Lee's Summit Unified Development Ordinance (UDO)
Project Address:	540 NE Town Centre Drive Lee's Summit, Missouri 64064
Property Owner:	WHD Management LLC PO Box 1059 Lee's Summit, MO 64063
Zoning:	PI - Planned Industrial
Proposed Land Use:	Limited Indoor Recreation
Building Setbacks:	
Street	20 ft
Side Yard	10 ft
Rear Yard	20 ft
Landscaping Setbacks:	
Street Frontage	20 ft
Height Requirements:	N/A
Number of Dwelling Units:	N/A

Special Conditions Met:
A commercial indoor and/or outdoor recreation facility or area shall be allowed provided the front entrance is 300 feet or greater distance from any residential district or use.

Adjacent Zoning (within 185'):	CP-2, RP-4
Adjacent Land Use (within 185'):	Commercial, Undeveloped, Residential, Government

Building Occupancy:

Pad Site A:	A-3, Limited Indoor Recreation - Batting Cages

Site Area

Pad Site A	83,267 sq. ft.	1.91 ac.

Building Area

Pad Site A	20,130 sq. ft.

Floor Area Ratio - Maximim 1.0

Pad Site A	20,130	/	83,267	0.24

Pervious/Impervious Areas

	pervious		impervious	
Pad Site A	24,656 sq. ft.	30%	58,611 sq. ft.	70%

Parking

Pad Site A: Indoor Batting -

Required: 4 per 1,000 sq. ft. of office space		20
batting cages: determined by director		-
	total:	65

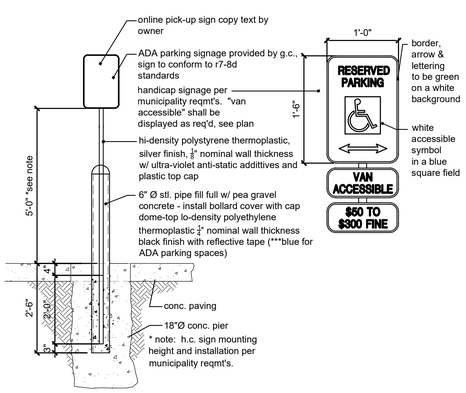
Standard Parking Space Size: 9'-0"x19'-0"
*Parking Space Length can reduce by 2'-0" at curbed landscaping and 6' deep sidewalks.

general notes

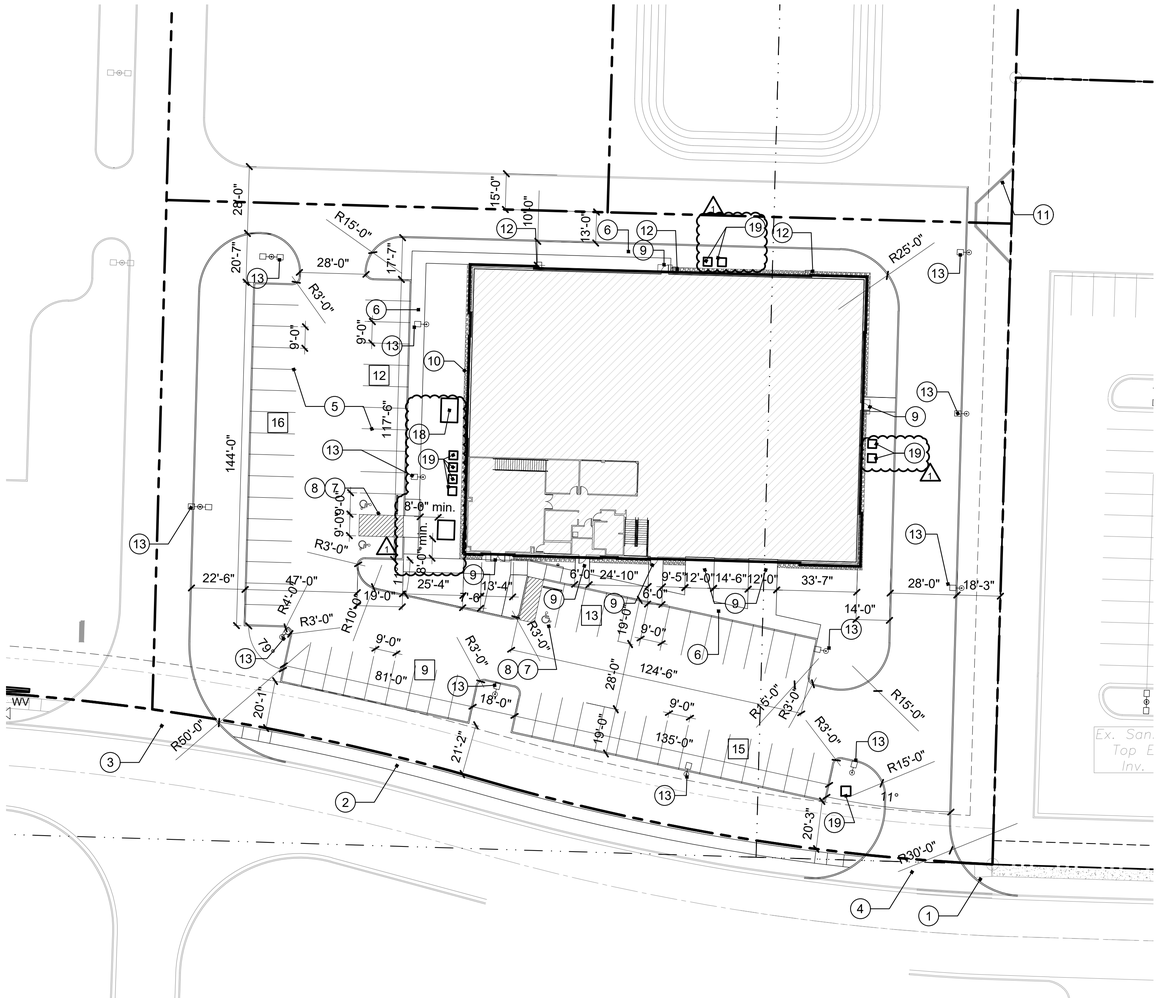
- All construction shall conform to the standards and specifications of Lee's Summit, Missouri.
- The general contractor shall contact all utility companies prior to the start of construction and verify the location and depth of any utilities that may be encountered during construction.
- The contractor shall field verify exist. surface & subsurface ground conditions prior to start of construction.
- Slopes shall maintain a maximum 3:1 slope.
- The contractor shall be responsible for obtaining all required permits, paying all fees, and otherwise complying with all applicable regulations governing the project.
- Place silt fence per civil for erosion control.
- Provide a temporary gravel access drive to prevent mud from being deposited onto the adjacent road.
- Prior to installing any structure on a public storm sewer, the contractor shall submit shop drawings for the structure(s). Installation shall not occur until drawings have been approved by public works.
- Prior to installing, constructing, or performing any work on the public storm sewer line (including connecting private drainage to the storm system) contact the city for inspection of the work. Contact must be made at least 48 hours prior to the start of work.
- Connections to the public storm sewer between structures will not be permitted.
- All exterior utility services shall be painted to match the primary building color.
- Signage shall comply with Lee's Summit Signage Ordinance.
- The property owner's association shall have ownership and maintenance responsibilities for the common area tract.
- Reference electrical plans for ground mounted equipment.

plan notes

1. Furnish and install 5'-0" wide concrete sidewalk with broom finish per city of Lee's Summit standards to connect to existing sidewalk.
2. Furnish and install 5'-0" wide concrete sidewalk with broom finish per city of Lee's Summit standards. Sidewalk shall be in the r.o.w. offset by 1'-0" from the property line.
3. Furnish and install new curb cut per city of Lee's Summit standards. Align with access across the street.
4. Furnish and install new curb cut per city of Lee's Summit standards.
5. Furnish and install 4" wide white parking space striping.
6. Furnish and install 6'-0" wide concrete sidewalk with broom finish per city of Lee's Summit standards.
7. Furnish and install handicap parking spaces with striped access aisle per UDO requirements.
8. Furnish and install handicap parking space bollard sign per UDO requirements.
9. Furnish and install door stoop with turn down edge doweled into building foundations; coordinate with civil drawings.
10. Furnish and install strip of clean rock at perimeter of building for drainage and maintenance if required by the geotechnical report.
11. Location of block retaining wall; reference civil drawings.
12. Furnish and install UDO compliant building mounted area light.
13. Furnish and install UDO compliant pole mounted area light; maximum top of pole height to be 18'-0".
14. Furnish and install ground mounted monument sign to meet ordinance requirements. Provide electrical to sign as required.
15. Furnish and install wall mounted sign to meet ordinance requirements. Provide electrical as required.
16. Property line.
17. Building setback line.
18. Furnish and install concrete pad for ground mounted RTU; provide landscape screening as required around the equipment.
19. Furnish and install equipment pad.



2 bollard parking sign
scale: 1/2" = 1'-0"



1 Site Plan
scale: 1" = 30'-0"

north

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STATE OF MISSOURI
CHRISTOPHER LEE HAFNER
NUMBER A-2012152
ARCHITECT
05.19.2022

a new development for
D-BAT - Town Centre Lot 1
540 NE Town Centre Drive
Lee's Summit, Missouri

date
05.23.2022
drawn by
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checked by
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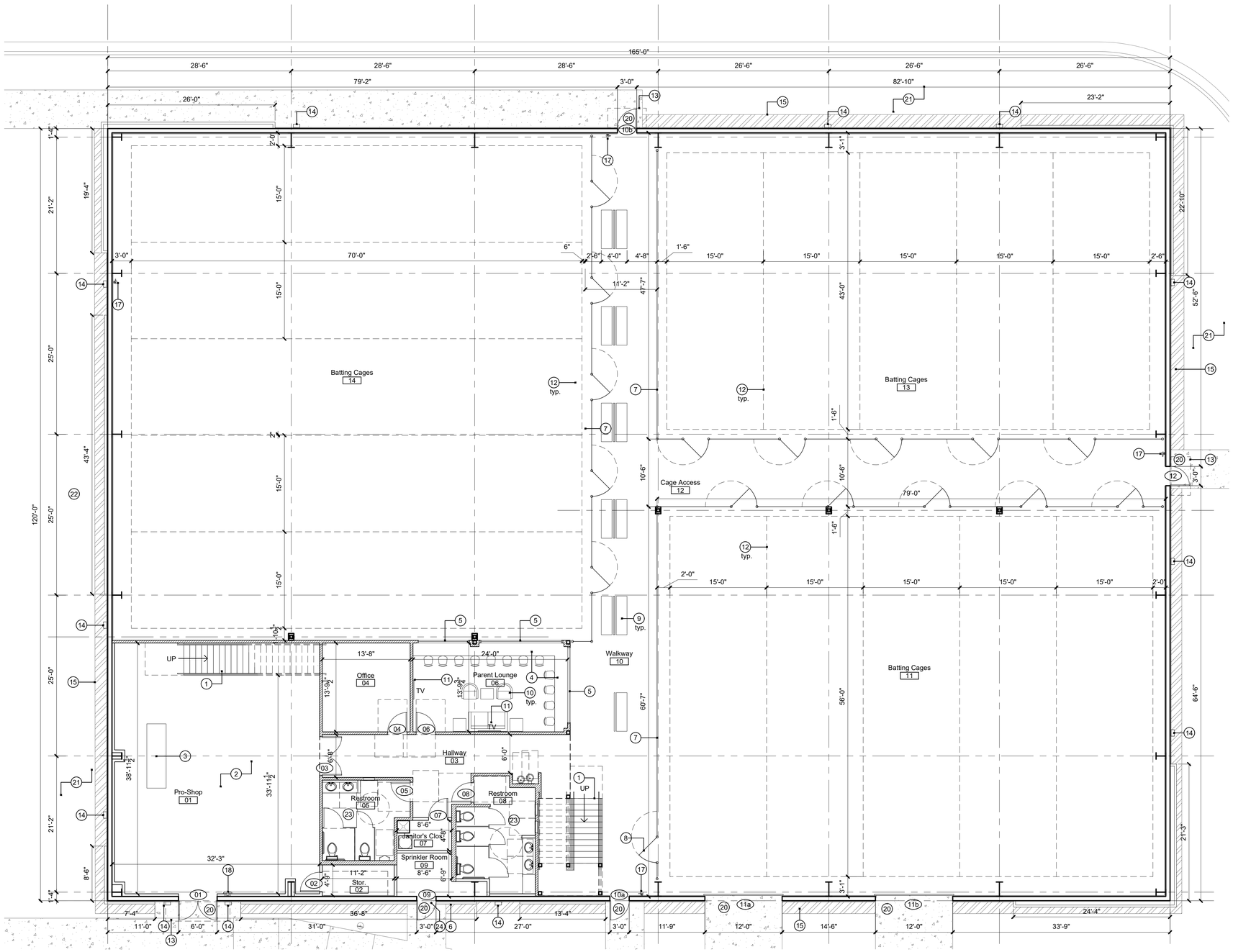
sheet number
A1.1
drawing type
FDP & Permit
project number
20231



1 Floor Plan
scale: 1/8" = 1'-0"
north

general notes

- Double keyed locks are not permitted on any required or marked exit.
- Exit/emergency lighting are subject to an on site inspection.
- Provide min. 3 1/2" batt insulation between conditioned & unconditioned spaces
- Exit doors shall be openable from the inside without the use of a key or any special knowledge or effort
- Provide electrical outlets @ 15" a.f.f. to the lowest outlet per a.d.a.
- Egress illumination will be provided at an intensity of not less than 1 foot candle at floor level.
- Construction materials exposed within plenums shall be noncombustible or shall have flame spread rating of not more than 25 and a smoke development rating of not more than 50.
- All electrical outlets within 6' of any sink or water source to be GFCI protected.
- Mezzanine floor height is 12'-0" above first floor.
- Paint liner panels in batting cage areas PT-4 (green) up to 12'-0" a.f.f.
- Reference DBAT standards for painting patterns.

construction notes (#)

1. PEMB Furnished and installed metal stair, painted; Furnish and install handrails with guardrails as required at stairs (paint handrails) - reference details on A0.1.
2. Merchandise display by others.
3. Verify point of sale location with owner. Coordinate stub up if required.
4. Furnish and install built-in bar height counter.
5. Furnish and install seamless interior windows.
6. Furnish and install Recessed knox box in stone. Verify final location with fire marshal.
7. Cage by others.
8. Provide access to overhead doors.
9. Benches by others.
10. Furniture by others.
11. Provide data and power at wall mounted TV location.
12. Netting by others.
13. Premanufactured awning above by PEMB manufacturer.
14. Decorative wall sconce.
15. Reference site and landscaping plans for perimeter rock.
16. Furnish and install millwork per details.
17. Furnish and install bracket mounted fire extinguisher, min. 5lb ABC.
18. Furnish and install semi-recessed ADA fire extinguisher cabinet (white) with min. 5lb ABC fire extinguisher.
19. Furnish and install metal guardrail at mezzanine viewing area; verify attachment to structure with structural engineer: railing must have supports/attachments a maximum of 5'-0" apart, and railing must meet loading requirements per the 2018 IBC. Railing selection must be a minimum of 42" above finish floor of the mezzanine - open space between railing parts must not allow a sphere of 4" or greater to pass through.
20. Furnish and install door stoops; reference structural.
21. Furnish and install prefabricated concrete pads for condensing units per mechanical drawings.
22. Provide concrete pad for ground mounted RTU as required, consult with structural.
23. Furnish and install ADA bathroom partitions.
24. Furnish and install lintel above door to support stone.

symbol legend:

- ## door tag
- ## construction note
- P# partition type
- room name ### room tag
- # A# # elevation
- # A# # wall section
- # A# # enlarged detail

partition legend

Insulated Interior Partition:
3-5/8" metal studs @ 16" o.c. to 6" above ceiling or to underside of decking with 5/8" gypsum board on both sides and 3-1/2" sound attenuation batt insulation. Stud gauge per supplier.

Interior Partition:
3-5/8" metal studs @ 16" o.c. to 6" above ceiling or to underside of decking with 5/8" gypsum board on both sides. Stud gauge per supplier.

*Utilize DensArmour Plus on plumbing walls

partition notes

- utilize 6" or 8" studs for plumbing walls
- walls with no ceiling shall extend up to underside of decking unless otherwise noted (reference reflected ceiling plan).
- walls with a lowered suspended ceiling should extend 6" above the ceiling height (reference reflected ceiling plan).
- interior wall height note: Utilize 3 5/8" metal studs @ 16" o.c. to an unbraced height of 13'-8, at heights up to 26'-0", utilize 6" 20 ga. studs @ 16" o.c. - adjust stud size as required for allowable L/240 deflection. Verify stud gauge with supplier.
- expansion joint note: Expansion joints shall be installed at a max. of 30'-0". Joints shall also be located to anticipate building movement, structural elements and substrate transition per elevations and wall sections.
- wet wall note: Utilize DensArmor Plus in all plumbing wet walls, walls receiving ceramic tile, and all walls adjacent to plumbing walls or where anticipated to be in contact with moisture.
- substrate: provide tile backerboard at any wall tile locations.
- blocking: Provide in wall blocking for all wall mounted items, including, but not limited to toilet accessories, plumbing fixtures, and hardware.
- maximum length of an unbraced wall shall be 8'-0".

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STATE OF MISSOURI
CHRISTOPHER LEE HAFNER
NUMBER
2007021521
ARCHITECT
06.20.2022

D-BAT - Town Centre Lot 1

a new development for

540 NE Town Centre Drive
Lee's Summit, Missouri

date
05.19.2022
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revisions

sheet number
A2.1
drawing type
FDP & Permit
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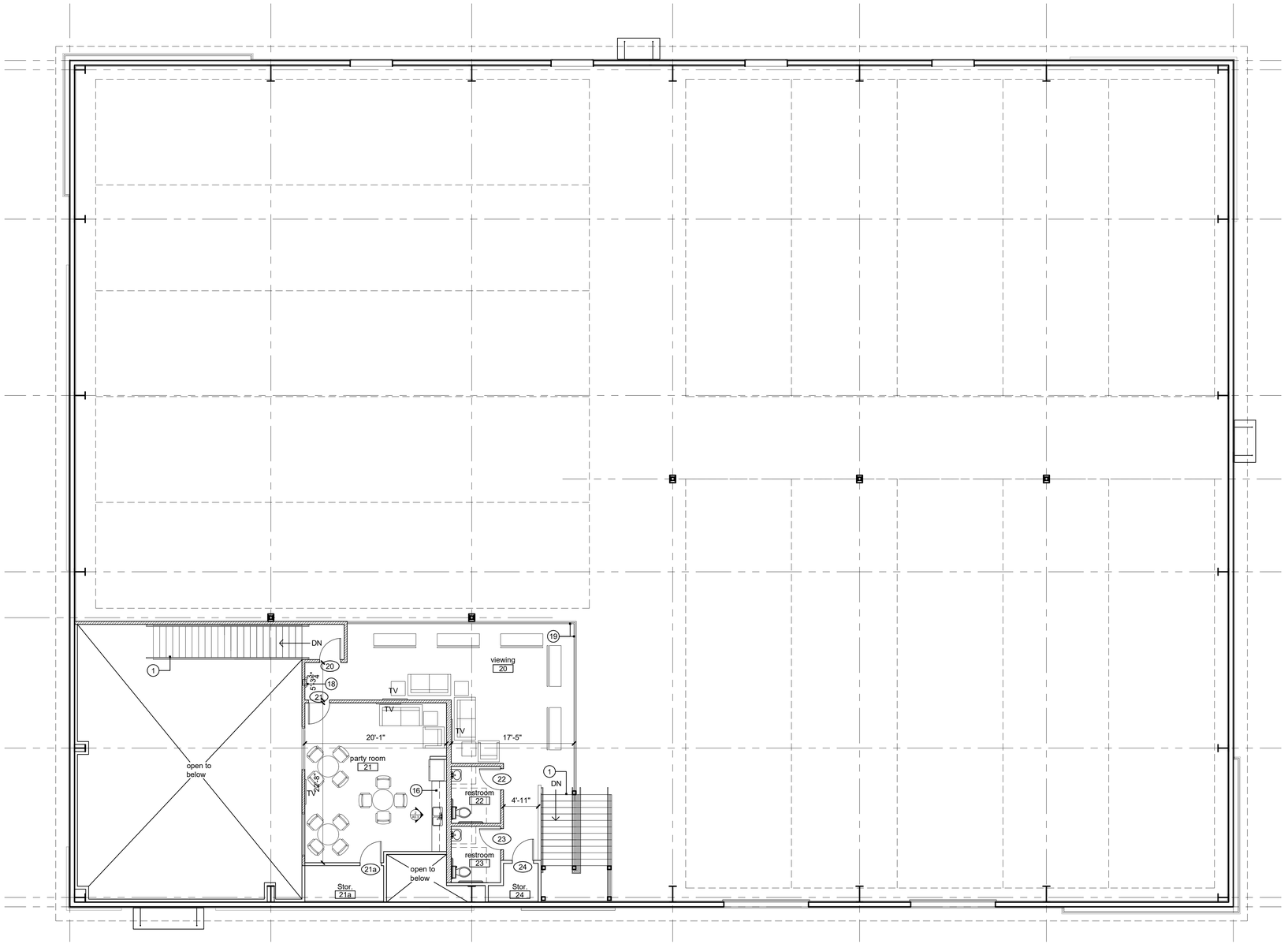

2 Mezzanine Plan
scale: 1/8" = 1'-0"
north

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- room name / #### room tag
- # / A# # elevation
- # / A# # wall section
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STATE OF MISSOURI
CHRISTOPHER LEE HAFNER
NUMBER A-2007031752
ARCHITECT
06.20.2022

a new development for
D-BAT - Town Centre Lot 1
540 NE Town Centre Drive
Lee's Summit, Missouri

date
05.19.2022
drawn by
DAE
checked by
DAE
revisions

sheet number
A2.2
drawing type
FDP & Permit
project number
20231

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reflected ceiling notes

- Paint exposed structure off-white in areas open to the public.
- Furnish and install 2x4 suspended ceiling with lighting per reflected ceiling plan.
- Exposed structure finish to remain as-is.
- Reference room finish schedule for ceiling heights
- all materials above suspended ceilings must be fire retardant

reflected ceiling legend

2x4 lay-in LED light fixture with direct/indirect lens for finished areas

2x4 LED utility light fixture for unfinished areas

CLG - 1: 2' x 4' x 3/4", with 15/16" Exposed Tee Grid System, color white

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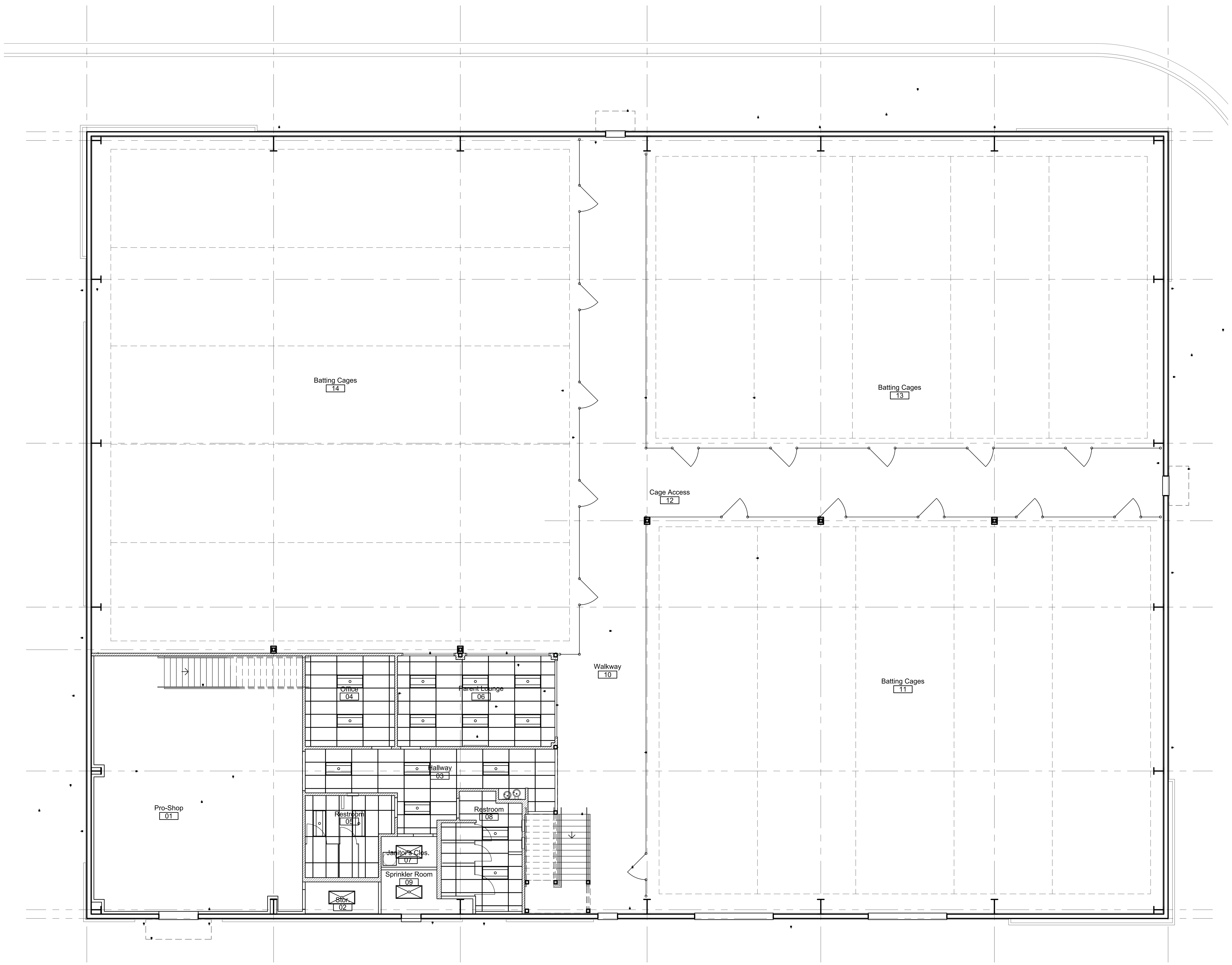

1 Reflected Ceiling Plan
scale: 1/8" = 1'-0"
north

a new development for
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reflected ceiling legend

(symbol)	2x4 lay-in LED light fixture with direct/indirect lens for finished areas
(symbol)	2x4 LED utility light fixture for unfinished areas
(symbol)	CLG - 1: 2' x 4' x 3/4", with 15/16" Exposed Tee Grid System, color white

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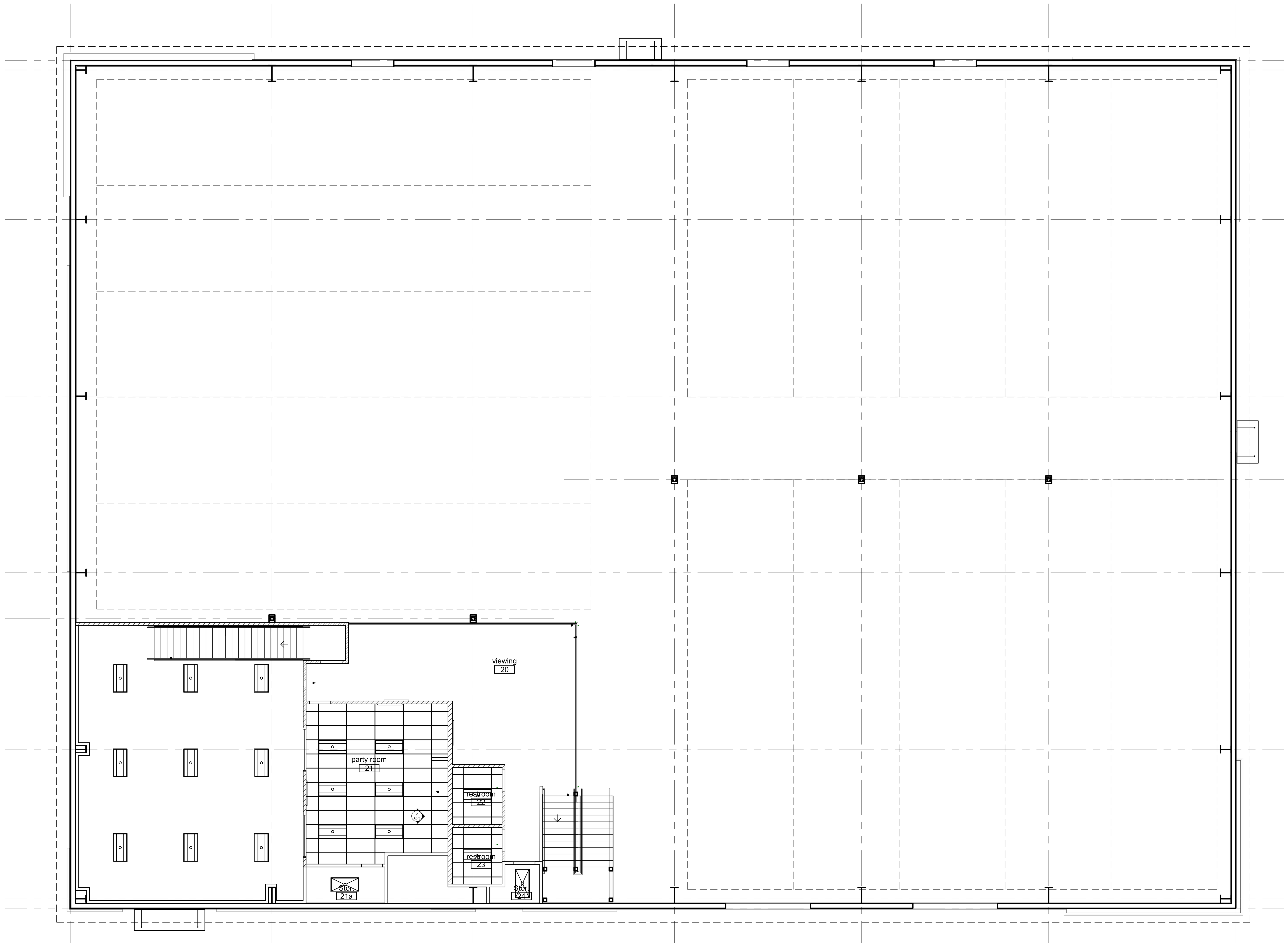

2 Mezzanine Reflected Ceiling Plan
scale: 1/8" = 1'-0"
north

a new development for
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sheet number
A2.4

drawing type
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project number
20231

general notes

- provide appropriate covers for flue penetrations - paint to match the building.
- furnish and install knox box; reference floor plan; verify final location with code official and fire department
- all building mounted equipment shall be painted to match the adjacent wall colors, including pipes, and panels; do not paint meters.
- furnish and install landscape screening for all building mounted equipment; reference MEP
- material substitutes and changes MUST be approved by the City of Lee's Summit prior to purchase
- provide blocking and electrical at building mounted sign locations
- reference window elevation sheet
- reference door schedule and detail sheets
- all signage must be reviewed as part of a separate sign permit through the City of Lee's Summit
- stone shall align with seams in metal panels
- windows shall be centered with metal panels

exterior materials & finishes

Metal Panel
Panel 2 - textured metal panel per PEMB supplier, color Gray
Panel 3 - textured metal panel per PEMB supplier, color Off-White
Panel 1 - tenant accent color, textured metal panel per PEMB supplier, color Blue

flashing/trim
prefinished to match adjacent wall colors

fascia panels
prefinished panels per PEMB supplier, color Black

soffit panels
color to match building fascia

prefabricated metal awnings per PEMB supplier, color Black

Gutter & Downspout:
To match PEMB wall panel Gray - per supplier

Stone
manufactured stone, Versetta ledgestone color

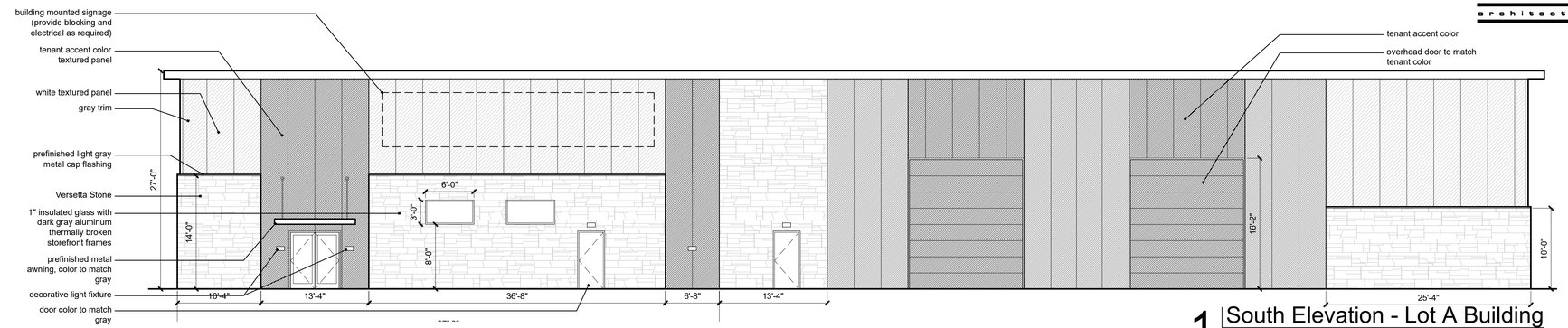
Windows
1" insulated low-e glass with argon fill in 2" thermally broken frames per PEMB supplier (caulk at perimeter inside and out); frames color Black

Storefront Door
1" insulated clear glass with thermally broken frames per PEMB supplier; frames color Black

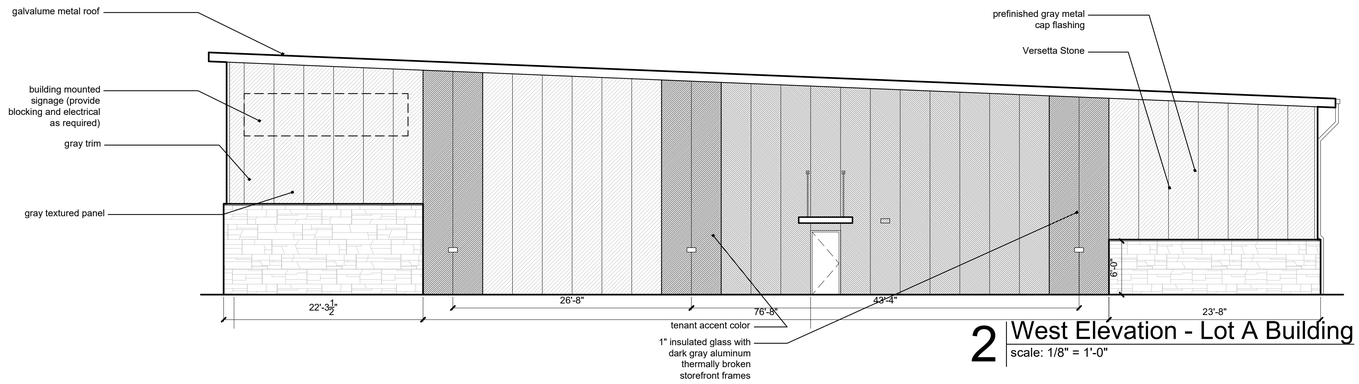
Overhead Doors
insulated manual overhead doors, painted to match tenant accent color per building elevations

Hollow Metal Doors
galvanized insulated hollow metal doorl and frame, painted to match adjacent wall color

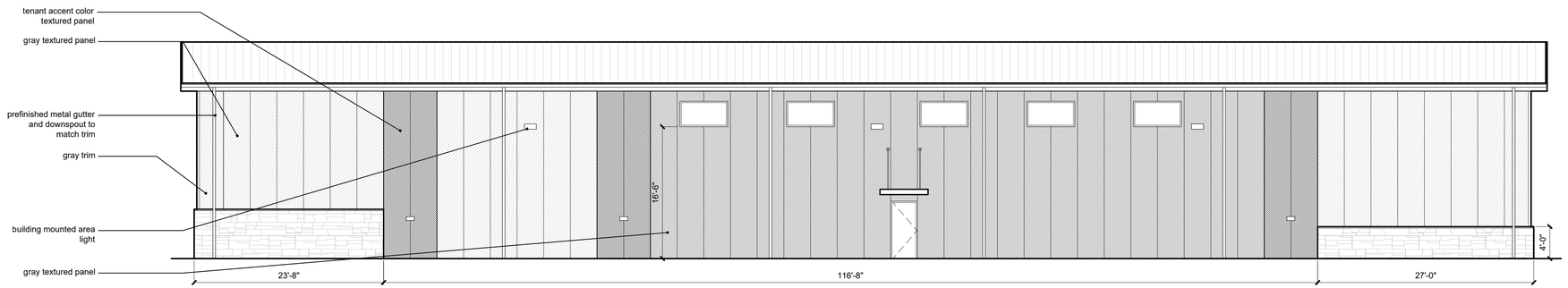
caulk - color to match adjacent wall colors



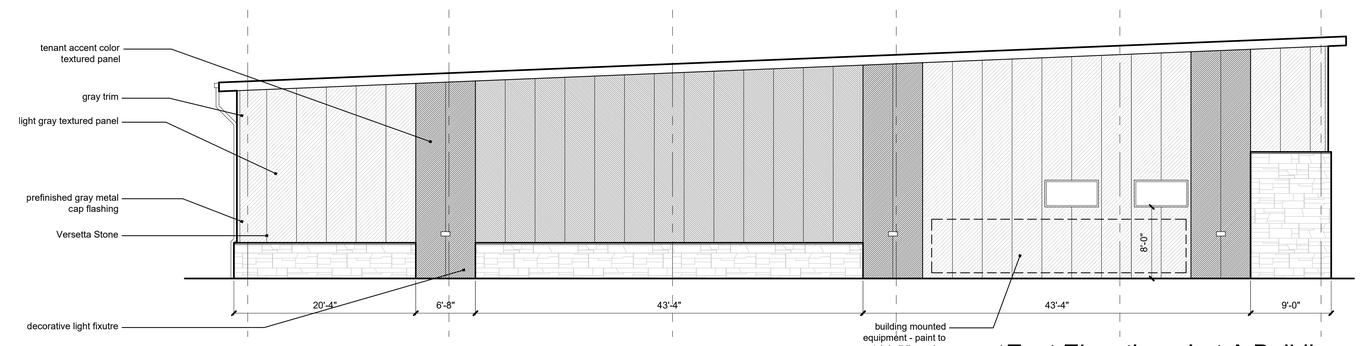
1 South Elevation - Lot A Building
scale: 1/8" = 1'-0"



2 West Elevation - Lot A Building
scale: 1/8" = 1'-0"



3 North Elevation - Lot A Building
scale: 1/8" = 1'-0"



4 East Elevation - Lot A Building
scale: 1/8" = 1'-0"

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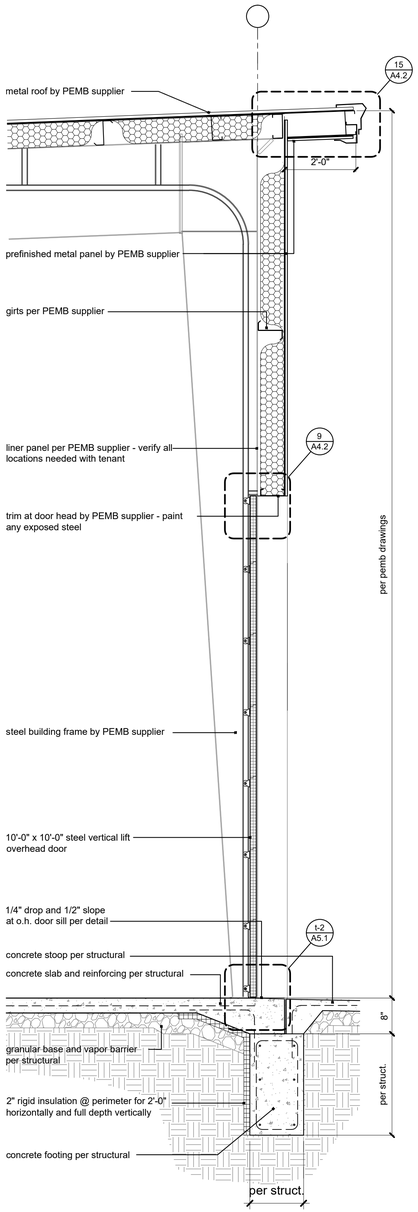
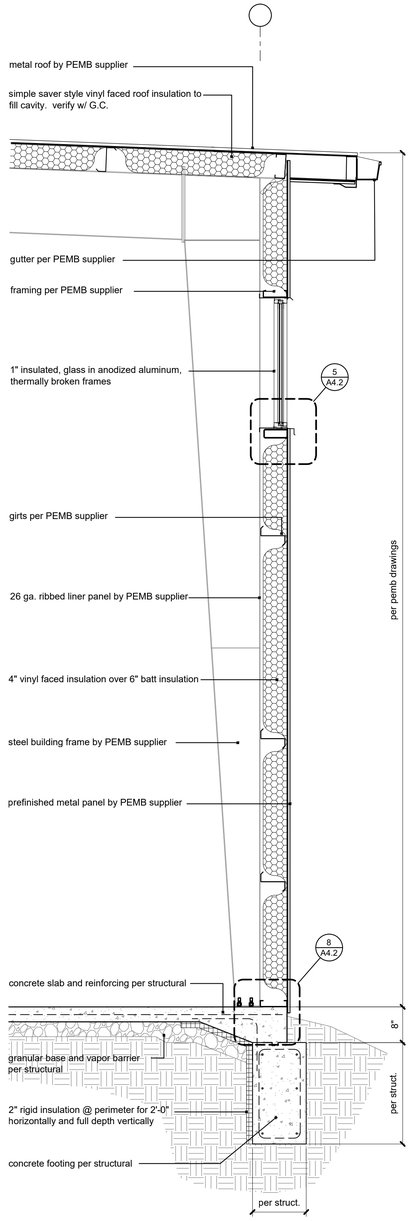


4 Wall Section
scale: 1/2" = 1'-0"



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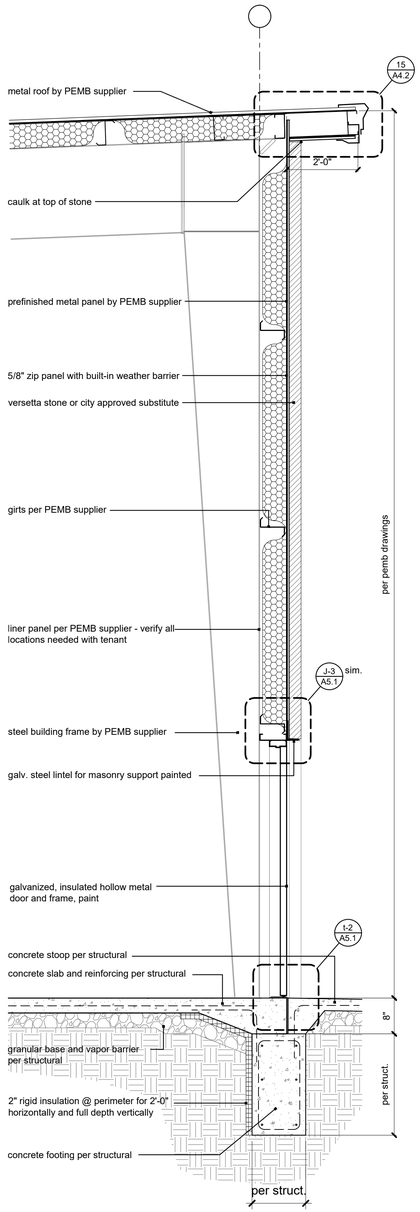

2 Wall Section
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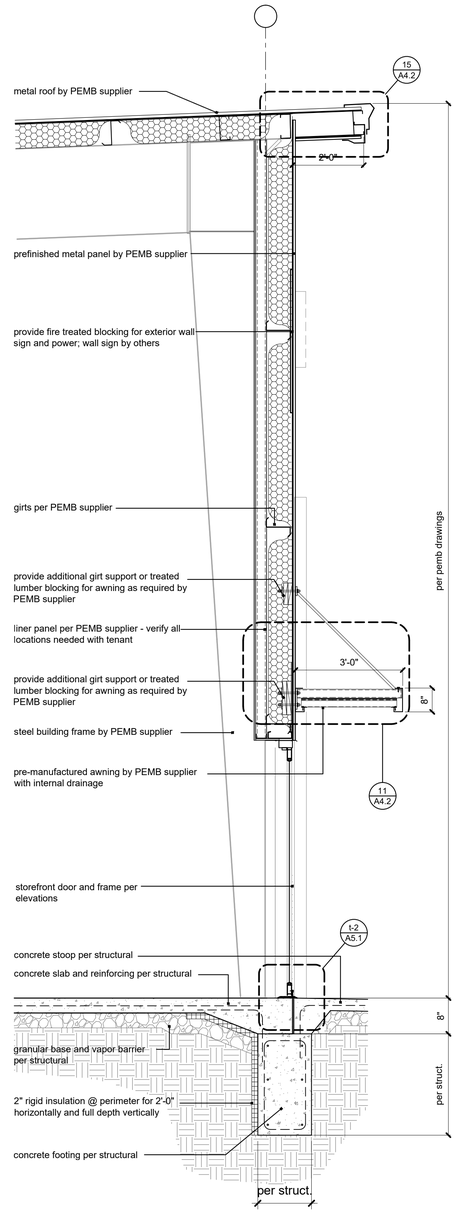

1 Wall Section
scale: 1/2" = 1'-0"

a new development for
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540 NE Town Centre Drive
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project number
20231

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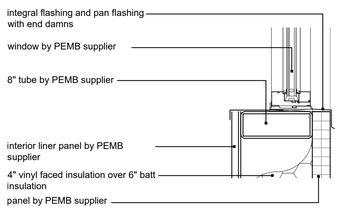
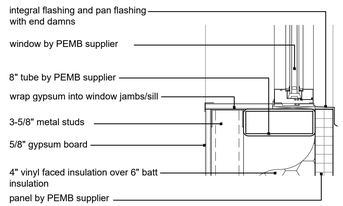
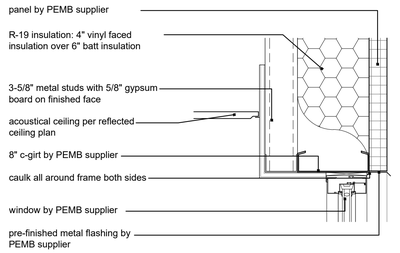


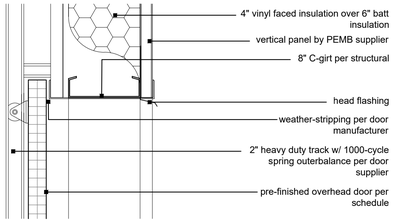
5 Clerestory Sill
scale: 1-1/2" = 1'-0"



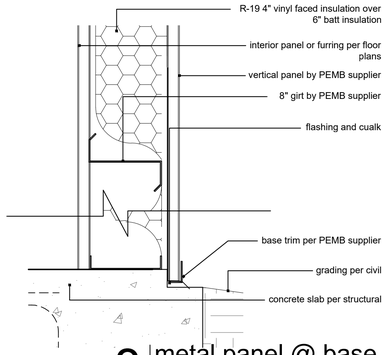
4 Window Sill @ Shop
scale: 1-1/2" = 1'-0"



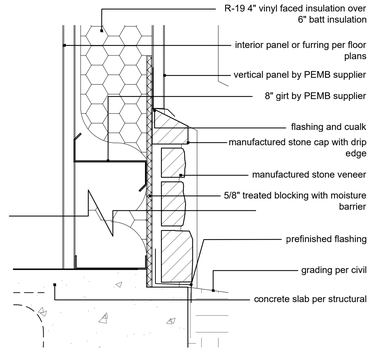
2 Window Head @ metal panel
scale: 1-1/2" = 1'-0"



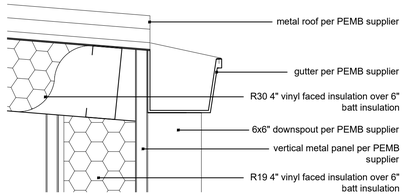
9 Ovhd Door
scale: 1-1/2" = 1'-0"



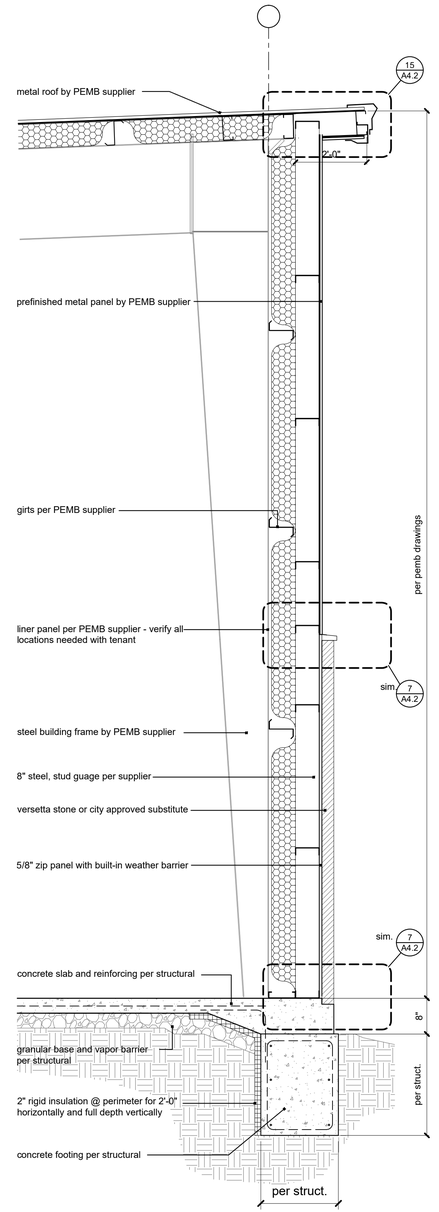
8 metal panel @ base
scale: 1-1/2" = 1'-0"



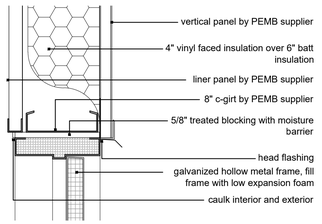
7 Stone Cap
scale: 1-1/2" = 1'-0"



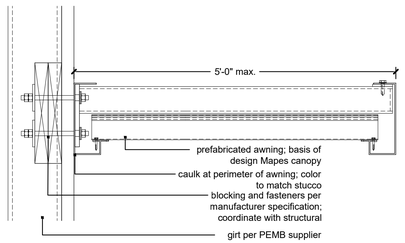
6 Gutter
scale: 1-1/2" = 1'-0"



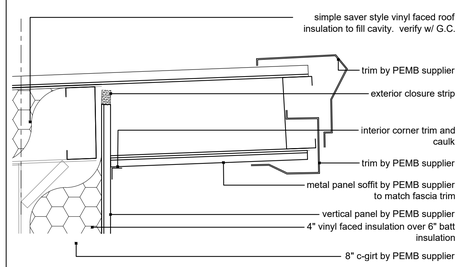
14 Wall Section
scale: 1/2" = 1'-0"



12 Door @ Liner Panel
scale: 1-1/2" = 1'-0"



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



15 Wall Section
scale: 1/2" = 1'-0"

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door schedule

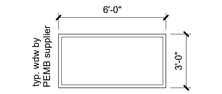
door #	doors						frames					fire rating	remarks
	type	mat.	finish	size: width	size: height	size: thick	type	material	finish	details: jamb	details: sill		
01	E	alum.	black	3'-0" pr.	7'-0"	1 3/4"	F4	alum.	black	J-2	t-1	"	verify color matches window frames
02	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
03	B	wd.	paint	3'-0" pr	7'-0"	1 3/4"	F2	h.m.	paint	J-4	-	"	
04	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
05	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
06	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
07	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
08	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
09	C	galv. h.m.	paint	3'-0"	7'-0"	1 3/4"	F1	galv. h.m.	paint	J-3	t-2	"	
10a	C	galv. h.m.	paint	3'-0"	7'-0"	1 3/4"	F1	galv. h.m.	paint	J-1	t-2	"	
10b	C	galv. h.m.	paint	3'-0"	7'-0"	1 3/4"	F1	galv. h.m.	paint	J-1	t-2	"	
11a	D	ovhd	prefin.	3'-0"	7'-0"	1 3/4"	-	-	-	-	t-3	"	paint door to match blue siding, verify size with PEMB dwgs
11b	D	ovhd	prefin.	3'-0"	7'-0"	1 3/4"	-	-	-	-	t-3	"	paint door to match blue siding, verify size with PEMB dwgs
12	C	galv. h.m.	paint	3'-0"	7'-0"	1 3/4"	F1	galv. h.m.	paint	J-1	t-2	"	
20	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
21a	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
21b	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
22	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
23	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	
24	A	wd.	paint	3'-0"	7'-0"	1 3/4"	F3	h.m.	paint	J-4	-	"	

door and hardware notes

- All hardware shall be clear anodized aluminum or close match with the exception of the exterior entry storefront door, which should match the window frames.
- Coordinate security hardware and electrical that may be required with tenant.
- All hinges at exterior doors shall have non-removable pins.
- Doors with closers shall have ball bearing hinges
- Threshold shall coordinate with adjacent floor finish at either site
- Hardware shall be heavy-duty, commercial grade, level 1 with lever handle
- Finish hardware shall meet article III of ADA
- Keying shall be coordinated with owner prior to order of hardware
- All storefronts shall be caulked around entire perimeter and at the inside corners
- All exterior doors shall include a rain guard
- All glazing shall comply with section 2406 of the 2018 IBC
- All glazing interior or exterior per Section 2406 of the 2018 IBC, including glass mirrors shall be constructed with safety glazing
- Category II glazing is required in storefront doors per section 2406 of the 2018 IBC
- Category A glazing shall be utilized in glazed panels greater than 9 sq. ft. per section 2406 of the 2018 IBC.
- Each pane of safety glazing installed in hazardous locations shall be identified by a manufacturer's designation specifying who applied the designation, the manufacturer or installer and the safety glazing standard with which is complies, as well as the information specified in '2403.1' Section 2403.1. The designation shall be acid etched, sand blasted, ceramic fired, laser etched, embossed or aof a type that once applied, cannot be removed without being destroyed. Tempered spandrel glass is permitted to be identified by the manufacturer with a removeable paper designation.
- Panic hardware shall be provided per section 1008.1.10 of the 2018 IBC.

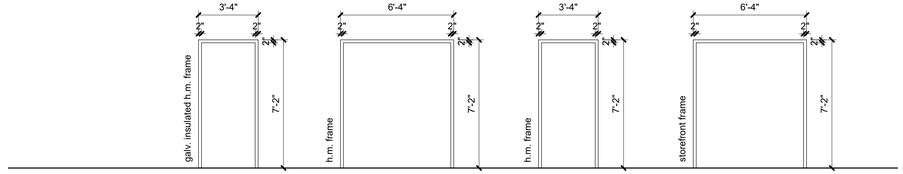
hardware list

1. exterior storefront door: 01 *match hardware color to door color)
   - 1.1. rain drip
   - 1.2. ADA offset door pull
   - 1.3. panic hardware with closer (compatible with storefront)
   - 1.4. entry door lockset
   - 1.5. none removeable hinges
   - 1.6. door sweep
   - 1.7. weather gasketing
   - 1.8. wall stop
2. exterior hollow metal door: 10a, 10b, 12
   - 2.1. rain drip
   - 2.2. ADA exterior lever handle
   - 2.3. panic hardware with closer
   - 2.4. lockset
   - 2.5. non removeable hinges
   - 2.6. door sweep
   - 2.7. weather gasketing
   - 2.8. floor stop (locate away from floor traffic to avoid tripping hazard)
3. interior double door: 03
   - 3.1. push bar with closer
   - 3.2. ADA door pullls
   - 3.3. vertical
   - 3.4. silencers
   - 3.5. non removable hinges
   - 3.6. wall stop
4. sprinkler room: 09
   - 4.1. rain drip
   - 4.2. ADA exterior lever handle
   - 4.3. closer
   - 4.4. nonremovable hinges
   - 4.5. door sweep
   - 4.6. weather gasketing
5. office door: 04
   - 5.1. door stop
   - 5.2. ADA lever handles with privacy lockset
   - 5.3. hinges
   - 5.4. silencers
   - 5.5. wall stop
6. party room/lounge: 06, 21
   - 6.1. closer
   - 6.2. ADA lever handles with storeroom lockset
   - 6.3. hinges
   - 6.4. silencers
   - 6.5. wall stop
7. multi-stall bathroom: 05, 08
   - 7.1. closer
   - 7.2. ADA door pull
   - 7.3. no-hands door pull
   - 7.4. push plate
   - 7.5. kick plate
   - 7.6. hinges
   - 7.7. silencers
   - 7.8. wall stop
8. single user bathroom: 22, 23
   - 8.1. closer
   - 8.2. ADA lever handles with privacy lockset
   - 8.3. hinges
   - 8.4. silencers
   - 8.5. wall stop
9. storage/closet: 02, 07, 21a, 24
   - 9.1. ADA lever handles with storeroom lockset
   - 9.2. hinges
   - 9.3. silencers
   - 9.4. wall stop
10. stair: 20
    - 10.1. panic hardware with closer
    - 10.2. ADA door pull
    - 10.3. silencers
    - 10.4. kick plates
    - 10.5. hinges
    - 10.6. wall stop

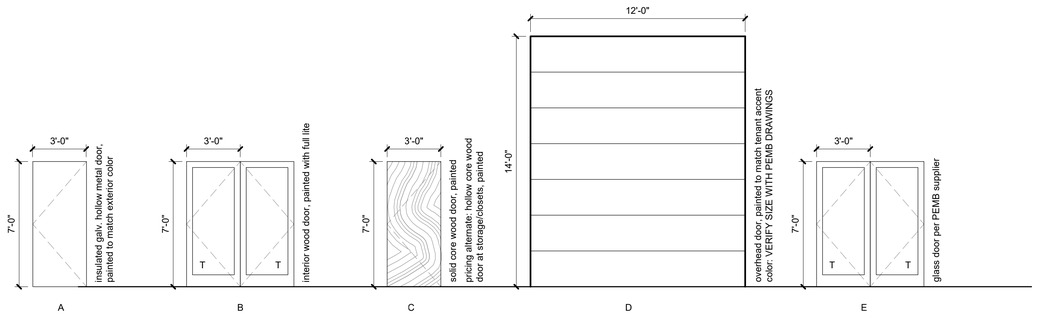


window jamb details by window manufacturer: provide prefinished flashing, caulk as required; provide galv. steel lintel at window heads in stone

2 window type
scale: 1/4" = 1'-0"

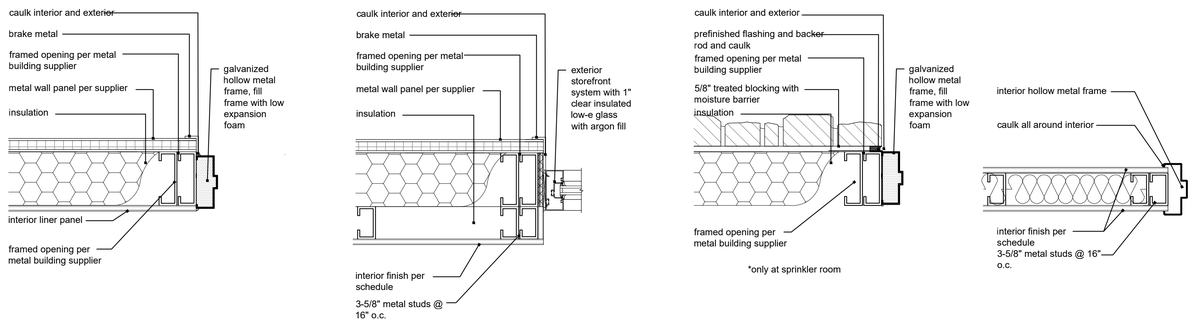


1 door frame types
scale: 1/4" = 1'-0"



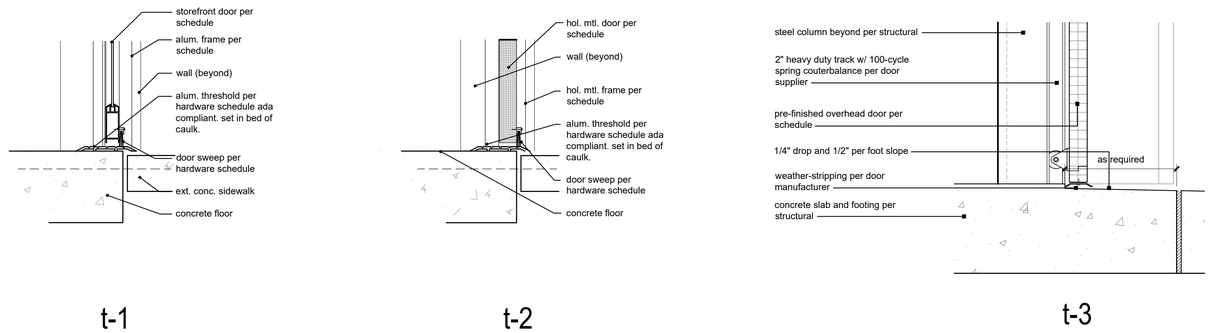
3 Door Types
scale: 1/4" = 1'-0"

T = tempered glass



j-1 j-2 j-3 j-4

4 Jamb Types
scale: 1-1/2" = 1'-0"



t-1 t-2 t-3

5 Threshold Types
scale: 1-1/2" = 1'-0"

RELEASED FOR CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
5/25/2022

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STATE OF MISSOURI
CHRISTOPHER LEE HAFNER
NUMBER A-2012020152
ARCHITECT
05.19.2022

D-BAT - Town Centre Lot 1

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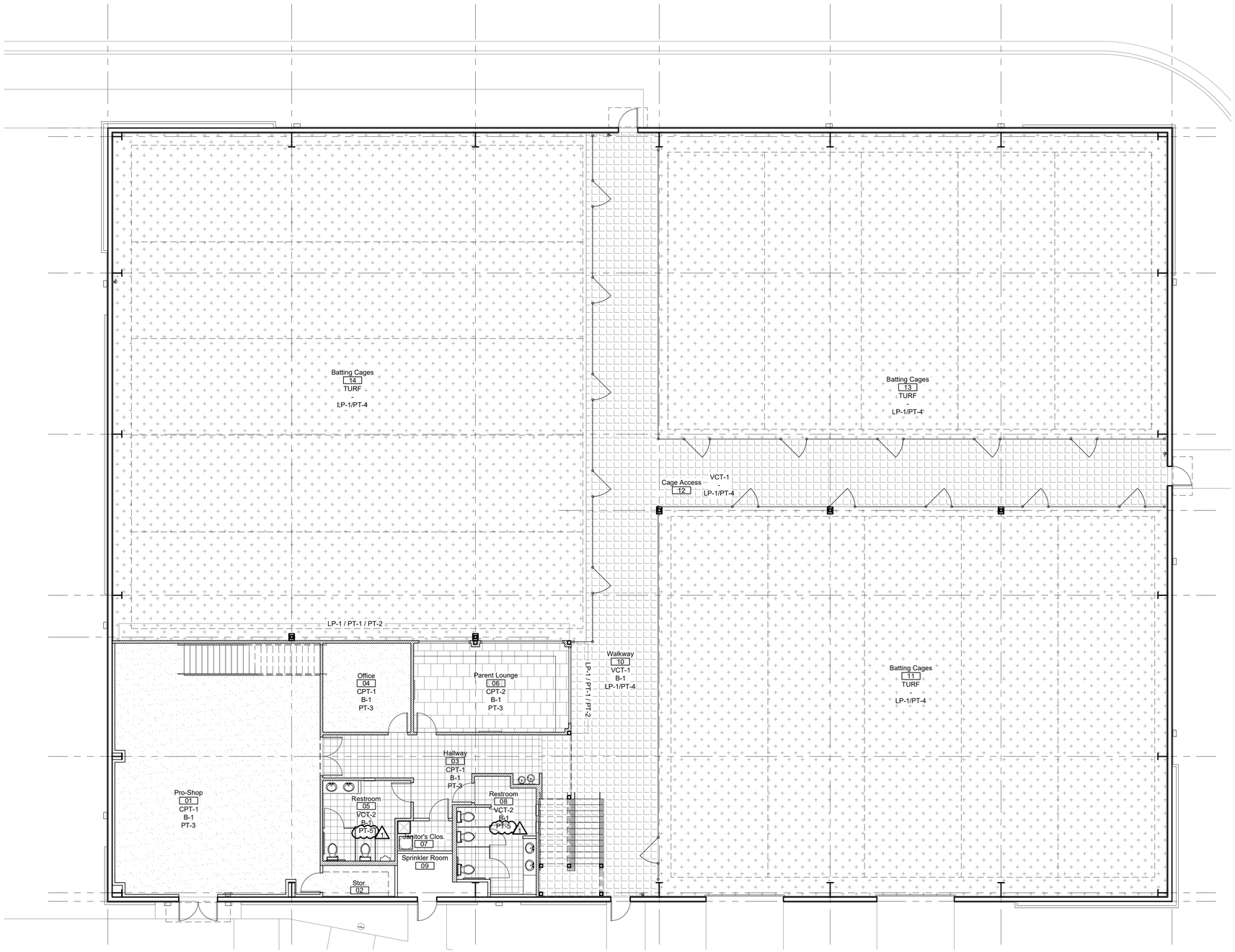
STATE OF MISSOURI
CHRISTOPHER LEE HAFNER
NUMBER A-2007020152
ARCHITECT
06.20.2022



TURF
VCT-1
CPT-1
VCT-2
CPT-2

1 Finish Floor Plan
scale: 1/8" = 1'-0"
north

D-BAT - Town Centre Lot 1

a new development for

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revisions

06.20.2022	1

sheet number
A5.2
drawing type
FDP & Permit
project number
20231

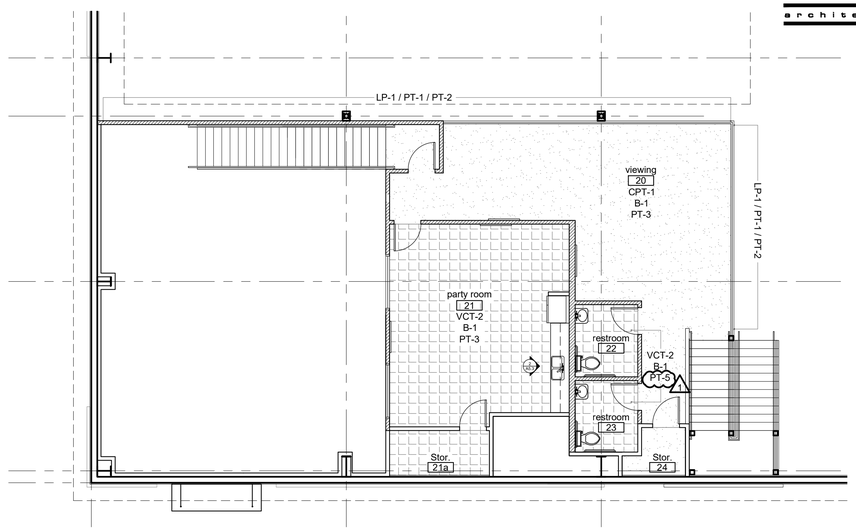
room finish schedule

room no.	room name	floor						base		wall				ceiling			remarks
		CPT-1	CPT-2	VCT-1	VCT-2	TURF	SC	b1	none	nw	sw	ne	se	act 1	open	clg. ht.	
01	Pro-Shop	●						●		wall finishes per plan 1/A5.2				●		open	-
02	Storage	●						●		wall finishes per plan 1/A5.2				●		open	-
03	Hallway			●				●		wall finishes per plan 1/A5.2				●		9'-0"	-
04	Office	●						●		wall finishes per plan 1/A5.2				●		8'-0"	-
05	Restroom			●				●		wall finishes per plan 1/A5.2				●		8'-0"	-
06	Parent Lounge		●					●		wall finishes per plan 1/A5.2				●		9'-0"	-
07	Janitor's Closet			●				●		wall finishes per plan 1/A5.2				●		8'-0"	-
08	Restroom			●				●		wall finishes per plan 1/A5.2				●		8'-0"	-
09	Sprinkler Room						●	●		wall finishes per plan 1/A5.2					●	open	-
10	Walkway				●				●	wall finishes per plan 1/A5.2					●	open	-
11	Batting Cages					●			●	wall finishes per plan 1/A5.2					●	open	-
12	Cage Access				●				●	wall finishes per plan 1/A5.2					●	open	-
13	Batting Cages					●			●	wall finishes per plan 1/A5.2					●	open	-
14	Batting Cages					●			●	wall finishes per plan 1/A5.2					●	open	-
20	Viewing	●						●		wall finishes per plan 1/A5.3					●	open	-
21	Party Room			●				●		wall finishes per plan 1/A5.3				●		9'-0"	-
21a	Storage			●				●		wall finishes per plan 1/A5.3				●		open	-
22	Restroom			●				●		wall finishes per plan 1/A5.3				●		8'-0"	-
23	Restroom			●				●		wall finishes per plan 1/A5.3				●		8'-0"	-
24	Storage	●						●		wall finishes per plan 1/A5.3				●		open	

finish legend

CPT-1	carpet tile, Philadelphia Commercial, style: Counterpart (54816), size: 24" x 24", color: Copilot (16400)
CPT-2	carpet tile, Philadelphia Commercial, style: Counterpart (54816), size: 24" x 24", color: Correlate (16505)
VCT-1	vinyl composite tile, Armstrong Flooring, style: Standard Excelon Imperial Texture VCT, size: 12" x 12", color: Gentian Blue (51946)
VCT-2	vinyl composite tile, Armstrong Flooring, style: Standard Excelon Imperial Texture VCT, size: 12" x 12", color: Pomegranate Red (51814)
	pricing alternate: basis of design Restek epoxy floor, colored flakes with red as primary color - submit sample for tenant approval
TURF	D-BAT Turf
SC	sealed concrete - ashford sealer
B-1	vinyl base, manufacturer: TBD, standard cove, size: 4", color: gray
PT-1	wall paint, manufacturer: TBD, finish: eggshell, color: D-Bat Gold (1 coat primer, 2 coats paint - to cover)
PT-2	wall paint, manufacturer: TBD, finish: eggshell, color: D-Bat Red (1 coat primer, 2 coats paint - to cover)
PT-3	wall paint, manufacturer: TBD, finish: eggshell, color: D-Bat White (1 coat primer, 2 coats paint - to cover)
PT-4	wall paint, manufacturer: TBD, finish: eggshell, color: D-Bat Green (1 coat primer, 2 coats paint - to cover) - from base to 12'-0" a.f.f.
1 PT-5	epoxy paint, manufacturer: TBD, color: D-Bat White (1 coat primer, 2 coats paint - to cover)
primer	primer, sherwin williams, PrepRite High Build latex primer/surfacer, B28W601
PL-1	plastic laminate, wilsonart, color: indigo (D379)
PL-2	plastic laminate, wilsonart, color: dove grey (D92)
ACT-1	acoustical ceiling tile, armstrong, 2x2, prelude xl 15/16" exposed tee grid, dune #1774, angled tegular (revealed), fine texture, white
LP-1	liner panel, Chief Buildings, steel liner panel, color: Emerald Green (EG)
door	door finish, manufacturer: TBD, color: manufacturer's standard white

TURF
VCT-1
CPT-1
VCT-2
CPT-2

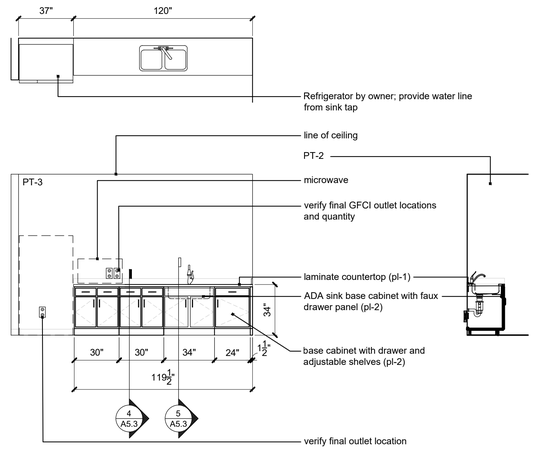


1 Mezzanine Finish Plan
scale: 1/8" = 1'-0"

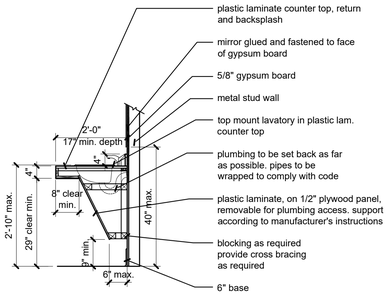
north

finish notes:

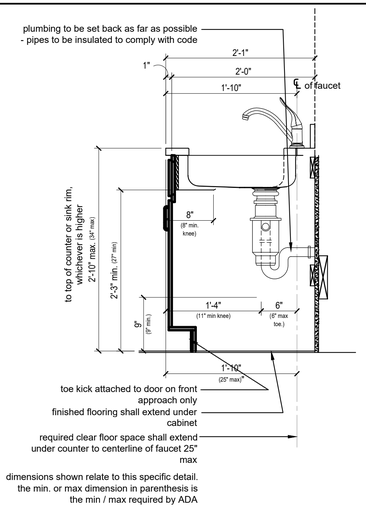
1. All interior glazing to be clear. Temper all interior glass.
2. Interior aluminum storefront shall have clear anodized aluminum finish
3. Each material specified for application on the entire project shall be from the same dye lot.
4. All surfaces shall be cleaned and conditioned to receive new finish 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. Carpet seams shall occur at junctions of partitions, thresholds or change of direction in corridors. No strip patch allowed smaller than 4'-0".
11. Finishes shall be bid as specified or as approved equal only.
12. Utilize dens-armour plus in all plumbing wet walls, walls anticipated to be in contact with moisture, or walls receiving ceramic tile.
13. All interior ceramic corners & tops shall receive schluter trim.
14. Refer to finish legend for level of gypsum board finish as defined by the gypsum association.
15. LVT to sealed concrete shall occur with rubber transition to match base color.



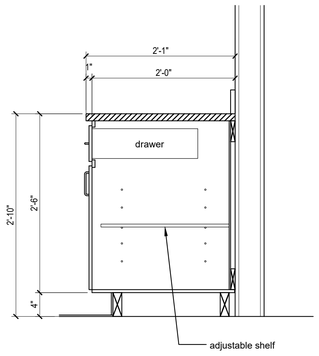
2 Party Room Elevation
scale: 1/4" = 1'-0"



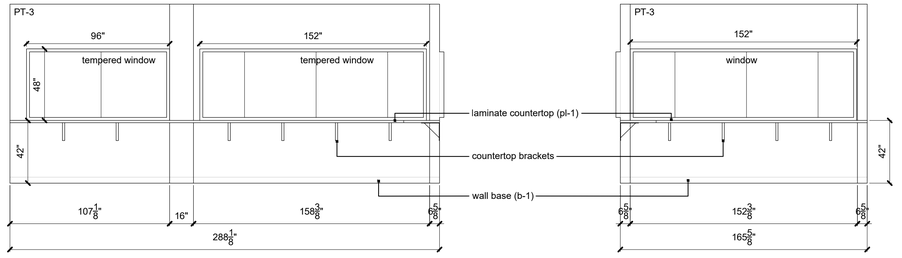
6 ADA sink
scale: 1/2" = 1'-0"



5 Sink Base Cabinet
scale: 1" = 1'-0"



4 Base Cabinet
scale: 1" = 1'-0"



3 Parents' Lounge Elevation
scale: 1/4" = 1'-0"

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STATE OF MISSOURI
CHRISTOPHER LEE HAFNER
NUMBER A-2007020152
ARCHITECT
06.20.2022

a new development for
D-BAT - Town Centre Lot 1
540 NE Town Centre Drive
Lee's Summit, Missouri

date
05.19.2022
drawn by
DAE
checked by
DAE
revisions

06.20.2022	1

sheet number
A5.3
drawing type
FDP & Permit
project number
20231

NOTES - FOUNDATION

1. CONTRACTOR SHALL BE FULLY FAMILIAR WITH IBC CHAPTER 18 FOR USE OF PRESUMPTIVE LOAD-BEARING CAPACITY.
2. CONTRACTOR SHALL USE IBC SPECIFICATIONS AND DETAILS FOR PLACEMENT OF PERIMETER DRAINS, UNDER-SLAB DRAINS, AND ANY OTHER SOILS RELATED ITEMS.
3. ALL FOUNDATIONS TO BEAR ON ORIGINAL, UNDISTURBED SOIL. REMOVE ANY MUD, ORGANIC SILT, ORGANIC CLAYS, PEAT OR UNPREPARED FILL PRIOR TO PLACING FOUNDATIONS.
4. ALL FOOTING EXCAVATIONS TO BE APPROVED BY A QUALIFIED GEOTECHICAL ENGINEER PRIOR TO PLACING CONCRETE.
5. ALL EXTERIOR AND PERIMETER FOOTINGS SHALL EXTEND BELOW FROST DEPTH, REFERENCE DESIGN INFORMATION FOR FROST DEPTH.

NOTES - CONCRETE

1. ALL CONCRETE CONSTRUCTION TO CONFORM TO ACI "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE", THE GOVERNING EDITION OF THE ACI 318, AND ACI "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" ACI 301, UNLESS NOTED OTHERWISE.
2. WATER REDUCING ADD MIXTURES ARE ALLOWED IN CONCRETE MIX DESIGNS.
3. SYNTHETIC MICRO-FIBERS ARE NOT ALLOWED UNLESS SPECIFICALLY NOTED IN THESE DRAWINGS.
4. UNLESS OTHERWISE SHOWN IN THE ARCHITECTURAL DRAWINGS, PROVIDE 3/4" CHAMFERS AT THE EDGES THAT ARE EXPOSED TO VIEW IN THE FINISHED STRUCTURE.
5. REFERENCE ARCHITECTURAL DRAWINGS FOR DOOR AND WINDOW OPENINGS, DRIP SLOTS, REGLETS, MASONRY, ANCHORS, BRICK LEDGE ELEVATIONS AND FOR MISCELLANEOUS EMBEDDED PLATES, BOLTS, ANCHORS, ANGLES, ETC.
6. REFERENCE ARCHITECTURAL DRAWINGS FOR CONCRETE FINISHES. WHERE FINISH IS NOT SPECIFIED, CONFORM TO REQUIREMENTS OF ACI 301.
7. REFERENCE MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR DRAINS, SLEEVES, OUTLET BOXES, CONDUIT, ANCHORS, ETC.
8. CONTACT APEX ENGINEERS, INC. IF HOUSE KEEPING PADS OR INERTIA BASES ARE REQUIRED BEYOND WHAT IS SHOWN IN THE STRUCTURAL CONTRACT DOCUMENTS.
9. ALL REINFORCING STEEL TO BE DETAILED IN ACCORDANCE WITH ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES."
10. REINFORCING SHALL BE CONTINUOUS WHEREVER POSSIBLE. SPLICES AND LAPS TO CONFORM TO ACI 318. REFER TO CONCRETE REBAR SCHEDULE.
11. DOWELS IN FOOTING, WALLS, AND DRILLED PIERS MUST BE IN POSITION BEFORE PLACING CONCRETE WHENEVER POSSIBLE.
12. REFERENCE TYPICAL FOUNDATION DETAILS FOR INFORMATION ON REINFORCING REQUIREMENTS AT WALL AND SLAB OPENINGS.
13. REFERENCE TYPICAL FOUNDATION DETAILS FOR INFORMATION ON REINFORCING REQUIREMENTS AT CORNER AND TEE INTERSECTIONS.
14. PROVIDE VERTICAL CONTROL JOINTS ON ALL POURED CONCRETE WALLS AND BASEMENT WALLS, EXCEPT FOUNDATION STEM WALLS LOCATED IN THE GROUND. SPACE JOINTS AT 3 x WALL HEIGHT FOR WALLS LESS THAN 10'-0" AND WALL HEIGHT FOR TALLER WALLS. PROVIDE ADDITIONAL JOINT WITHIN 10'-0" OF CORNERS.
15. OPENINGS IN SLAB OF 1'-4" AND LESS ON A SIDE ARE GENERALLY NOT SHOWN ON THE STRUCTURAL DRAWINGS. REFERENCE ARCHITECTURAL AND MECHANICAL DRAWINGS FOR SUCH OPENINGS.

NOTES - STEEL

1. ALL STRUCTURAL STEEL TO BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE GOVERNING EDITION OF THE AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES."
2. BOLTED CONNECTIONS: ALL BOLTED CONNECTIONS SHALL BE SNUG-TIGHT IN ACCORDANCE WITH THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM F3125 GRADE A325 OR A490 BOLTS" PUBLISHED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS.
3. WELDED CONNECTIONS: ALL WELDING SHALL BE IN ACCORDANCE WITH THE "STRUCTURAL WELDING SOCIETY CODE" (AWS D1.1) PUBLISHED BY THE AMERICAN WELDING SOCIETY. ELECTRODES FOR WELDING SHALL COMPLY WITH THE REQUIREMENTS OF TABLE 3.1 OF (AWS D1.1). ALL WELDING TO BE DONE BY QUALIFIED WELDERS CONFORMING TO THE AMERICAN WELDING SOCIETY STANDARDS.
4. SPLICING OF STEEL MEMBERS, UNLESS SHOWN ON THE DRAWINGS, IS PROHIBITED WITHOUT THE WRITTEN APPROVAL OF APEX ENGINEERS, INC.
5. CHANGES IN SIZE OR POSITION OF THE STRUCTURAL ELEMENTS, AND HOLES, SLOTS, CUTS, ETC. THROUGH ANY MEMBER, ARE NOT PERMITTED UNLESS THEY ARE DETAILED ON THE APPROVED SHOP DRAWINGS.
6. NO FINAL BOLTING OR WELDING SHALL BE MADE UNTIL AS MUCH OF THE STRUCTURE AS WILL BE STIFFENED THEREBY HAS BEEN PROPERLY ALIGNED.
7. FABRICATE ALL BEAMS WITH THE MILL CAMBER UP UNO.
8. ALL VISIBLE WELDED CONNECTIONS ON ARCHITECTURAL ELEMENTS TO BE GROUND SMOOTH. DO NOT REDUCE THROAT SIZE OF WELD.
9. THE FABRICATOR SHALL BE RESPONSIBLE FOR THE DESIGN AND PERFORMANCE OF ALL CONNECTIONS NOT FULLY DESIGNED OR DETAILED IN THE CONTRACT DOCUMENTS. FABRICATOR TO PROVIDE ENGINEERED STAMPED SHOP DRAWINGS AND CALCULATIONS FOR ALL CONNECTIONS THAT DO NOT COMPLY WITH AISC STEEL CONSTRUCTION MANUAL CHAPTER 10 SIMPLE SHEAR CONNECTIONS.
10. STEEL MEMBERS ON THE EXTERIOR OF THE BUILDING OR EXPOSED TO SOIL MUST BE, AT A MINIMUM, PROPERLY PRIMED WITH RUST INHIBITING PRIMER AND PAINTED. STEEL MEMBERS COMPLETELY ENCLOSED IN BUILDING ENVELOPE DO NOT REQUIRE PRIMER OR PAINT, UNO. REFER TO ARCHITECTURAL DOCUMENTS FOR ADDITIONAL REQUIREMENTS OF EXPOSED STEEL.

NOTES - GENERAL

1. THESE DRAWINGS ARE INTENDED TO BE USED WITH ARCHITECTURAL AND MECHANICAL DRAWINGS. CONTRACTOR IS RESPONSIBLE FOR COORDINATING SUCH REQUIREMENTS INTO THEIR SHOP DRAWINGS AND WORK.
2. NO OPENING SHALL BE MADE IN ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.
3. NO CHANGE IN SIZE OR DIMENSION OF STRUCTURAL MEMBERS SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER
4. THE CONTRACTOR IS RESPONSIBLE FOR LIMITING THE AMOUNT OF CONSTRUCTION LOAD IMPOSED UPON STRUCTURAL FRAMING. CONSTRUCTION LOADS SHALL NOT EXCEED THE DESIGN CAPACITY OF THE FRAMING AT THE TIME THE LOADS ARE IMPOSED.
5. THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL TEMPORARY BRACING AND/OR SUPPORT THAT MAY BE REQUIRED AS THE RESULT OF THE CONTRACTOR'S CONSTRUCTION METHODS AND/OR SEQUENCES.
6. UNLESS OTHERWISE NOTED, FIREPROOFING METHODS AND MATERIALS FOR STRUCTURAL MEMBERS ARE NOT SHOWN ON STRUCTURAL DRAWINGS. REFERENCE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR FIRE RATING REQUIREMENTS, FIRE PROOFING METHODS AND MATERIALS.
7. DO NOT SCALE THESE DRAWINGS. USE DIMENSIONS SHOWN ON PLANS.
8. THE CONTRACTOR SHALL INFORM THE ARCHITECT/ENGINEER OF ANY DEVIATION FROM THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL NOT BE RELIEVED OF THE RESPONSIBILITY FOR SUCH DEVIATION BY THE ARCHITECT/ENGINEER'S APPROVAL OF SHOP DRAWINGS, PRODUCT DATA, ETC., UNLESS HE HAS SPECIFICALLY INFORMED THE ARCHITECT/ENGINEER OF SUCH DEVIATION AT THE TIME OF SUBMISSION, AND THE ARCHITECT/ ENGINEER HAS GIVEN WRITTEN APPROVAL TO THE SPECIFIC DEVIATION.
9. ALL THINGS WHICH, IN THE OPINION OF THE CONTRACTOR, APPEAR TO BE DEFICIENCIES, OMISSIONS, CONTRADICTIONS, BE BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER. PLANS AND/OR SPECIFICATIONS WILL BE CORRECTED, OR WRITTEN INTERPRETATION OF THE ALLEGED DEFICIENCY, OMISSION, CONTRADICTION OR AMBIGUITY WILL BE MADE BY THE ARCHITECT/ENGINEER BEFORE THE AFFECTED WORK PROCEEDS.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ERRORS OF DETAILING, FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL MAKE ALL MEASUREMENTS IN THE FIELD NECESSARY TO VERIFY OR SUPPLEMENT DIMENSIONS SHOWN ON THE CONTRACT DRAWINGS AND HE SHALL VERIFY THAT ALL DIMENSIONS SHOWN ON THE SHOP DRAWINGS ARE COORDINATED WITH THE DIMENSIONS AND REQUIREMENTS OF THE CONTRACT DRAWINGS. REVIEW OF THE SHOP DRAWINGS DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR COMPLETING THE WORK SUCCESSFULLY IN ACCORDANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS.
11. SUBMIT PRINTS OR ELECTRONIC COPIES OF EACH SHOP DRAWINGS. REPRODUCIBLE COPIES OF CONTRACT DOCUMENTS SHALL NOT BE USED AS SHOP DRAWINGS. SHOP DRAWINGS SHALL BE REVIEWED BY CONTRACTOR PRIOR TO SUBMISSION. CONTRACTOR STAMP SHOP DRAWINGS ACCEPTING RESPONSIBILITY FOR COORDINATION OF DIMENSIONS SHOWN IN THE CONTRACT DOCUMENTS, QUANTITIES AND COORDINATION WITH OTHER TRADES. DRAWINGS NOT BEARING CONTRACTOR'S STAMP MAY BE REJECTED AT THE DISCRETION OF THE ARCHITECT OR STRUCTURAL ENGINEER.
12. REVIEW AND RETURN OF SHOP DRAWINGS SHALL BE BASED ON A MINIMUM OF TEN (10) WORKING DAYS IN THE STRUCTURAL ENGINEER'S OFFICE FROM RECEIPT OF SUBMISSION TO RETURN TO THE NEXT PARTY FOR THEIR ACTION. SHOP DRAWINGS SHOULD BE SUBMITTED INCREMENTALLY AS APPROPRIATE PACKAGES ARE PREPARED TO EQUALIZE THE WORKLOAD FOR REVIEW OF THE DRAWINGS. SUBMISSION OF A LARGE VOLUME OF SHOP DRAWINGS AT ONE TIME MAY RESULT IN REVIEW TIMES WHICH WILL EXCEED THOSE NOTED ABOVE. DEFINITION OF A "LARGE VOLUME" OF SHOP DRAWINGS IS SUBJECT TO INTERPRETATION.

NOTES - DEFERRED SUBMITTALS

1. THE ARCHITECT OR ENGINEER OF RECORD SHALL LIST THE DEFERRED SUBMITTALS ON THE PLANS FOR REVIEW BY THE BUILDING OFFICIAL.
2. DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE ARCHITECT OR ENGINEER OF RECORD WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN THE GENERAL CONFORMANCE TO THE DESIGN OF THE BUILDING.
3. THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY THE BUILDING OFFICIAL.
4. DEFERRED SUBMITTALS ARE DEFINED AS THOSE PORTIONS OF THE DESIGN THAT ARE NOT SUBMITTED AT THE TIME OF THE APPLICATION AND THAT ARE TO BE SUBMITTED TO THE BUILDING OFFICIAL WITHIN A SPECIFIED PERIOD.
5. DEFERRAL OF ANY SUBMITTAL ITEMS SHALL HAVE THE PRIOR APPROVAL OF THE BUILDING OFFICIAL.
6. SUBMITTALS SHALL INCLUDE DETAILED DRAWINGS OF EACH MEMBER AND ITS CONNECTIONS ALONG WITH SUPPORTING CALCULATIONS PREPARED UNDER THE SUPERVISION, BEARING THE SEAL AND SIGNATURE, OF A LICENSED PROFESSIONAL ENGINEER IN THE PROJECT JURISDICTION.
7. CONTRACTOR SHALL SUBMIT STRUCTURAL DEFERRED SUBMITTAL FOR THE FOLLOWING:
   - STEEL GUARDRAILS AND HANDRAILS
   - STEEL FABRICATED STAIRS AND LADDERS
   - PRE-MANUFACTURED CANOPIES AND AWNINGS

NOTES - SHOP DRAWING SUBMITTALS

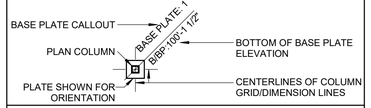
1. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS IN ADDITION TO ITEMS REQUIRED BY ARCHITECTURAL SPECIFICATIONS. SHOP DRAWING REVIEW IS INTENDED FOR VERIFICATION OF DESIGN CONCEPT CONVEYANCE AND GENERAL CONFORMANCE TO CONTRACT DOCUMENTS ONLY.
2. CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM CONTRACT DOCUMENTS SHALL BE CLOUDED BY MANUFACTURER/FABRICATOR. ANY OF THE AFOREMENTIONED WHICH ARE NOT CLOUDED OR FLAGGED BY SUBMITTING PARTIES SHALL NOT BE CONSIDERED APPROVED AFTER ENGINEER'S REVIEW, UNO.
3. SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. ITEMS SHOWN INCORRECTLY OR OMITTED AND NOT FLAGGED BY THE ENGINEER DURING REVIEW ARE NOT TO BE CONSIDERED CHANGES TO THE CONTRACT DOCUMENTS.
4. THE ADEQUACY OF ENGINEERING DESIGNS AND LAYOUT PERFORMED BY OTHERS RESTS WITH THE DESIGNING OR SUBMITTING AUTHORITY. DESIGNED SHOP DRAWINGS SHALL BE PREPARED UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER.
5. SHOP DRAWINGS MUST BE ORIGINAL DOCUMENTS. REPRODUCTION OF ANY PORTION OF THE CONTRACT DOCUMENTS FOR USE IN SUBMITTALS IS NOT PERMITTED AND MAY RESULT IN REJECTION.
6. THE ENGINEER HAS THE RIGHT TO APPROVE OR DISAPPROVE ANY CHANGES TO CONTRACT DOCUMENTS AT ANY TIME BEFORE OR AFTER SHOP DRAWING REVIEW.
7. CONTRACTOR SHALL SUBMIT STRUCTURAL SHOP DRAWINGS FOR THE FOLLOWING:
   - CONCRETE MIX DESIGN, MATERIALS, AND TEST REPORTS
   - CONCRETE REINFORCING STEEL, HARDWARE, AND FASTENERS
   - PRE-ENGINEERED METAL BUILDING

SYMBOLS / ABBREVIATIONS

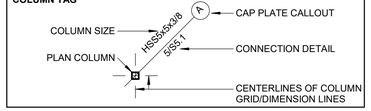
SYMBOL/TAG	DESCRIPTION	APPLIES TO
X / SX.X	DETAIL ON SHEET / SHEET NUMBER	DETAILS, SECTIONS, & ELEVATIONS
T.O.W. = XXX' - XX" / B.O.W. = XXX' - XX"	ELEVATION (TOP) ELEVATION (BOTTOM)	FOUNDATION WALLS AND LEDGES (SIM)
T.O.X. XXX' - XX"	ELEVATION MARK	LEVELS, SPOT ELEVATIONS, & PLAN ELEVATIONS
T.O.S. = XXX' - XX"	TOP OF STEEL ELEVATION	PLAN VIEW NOTATIONS
JST BRG = XXX' - XX"	JOIST BEARING ELEVATION	PLAN VIEW NOTATIONS
X	REVISION MARK	SHEET REVISIONS

ABV	DEFINITION	ABV	DEFINITION
AB	ANCHOR BOLT	SIM	SIMILAR CONDITION
CJ	CONTRACTION JOINT	STD	STANDARD
CL	CENTERLINE	TOC	TOP OF CONCRETE
DIA	DIAMETER	TOD	TOP OF DECK
EOD	EDGE OF DECK ANGLE	TOL	TOP OF LEDGE
EOS	EDGE OF SLAB	TOM	TOP OF MASONRY
EXT	EXTERIOR	TOS	TOP OF STEEL
GA	GAUGE	TOW	TOP OF WALL
HAS	HEADED ANCHOR STUDS	TYP	TYPICAL CONDITION
OC	ON CENTER	UNO	UNLESS NOTED OTHERWISE
PAF	POWDER ACTUATED FASTNR	WP	WORK POINT

BASE PLATE TAG



COLUMN TAG



DESIGN INFORMATION

BUILDING CODE:

2018 INTERNATIONAL BUILDING CODE AS ADOPTED AND/OR AMENDED BY LOCAL BUILDING CODES

SOILS INFORMATION:

THE FOUNDATION DESIGN PROVIDED IS BASED OFF OF A MINIMUM ALLOWABLE PRESUMPTIVE LOAD-BEARING VALUE AS INDICATED BY IBC TABLE 1606.2 IN LIEU OF A SITE BASE GEOTECHNICAL EVALUATION. IT IS RECOMMENDED THAT A QUALIFIED GEOTECHNICAL ENGINEER BE RETAINED TO VERIFY THESE ASSUMPTIONS PRIOR TO CONSTRUCTION. BY USE OF THIS FOUNDATION DESIGN WITHOUT PROVIDING SUCH VERIFICATION, APEX WILL NOT BE LIABLE FOR THIS DESIGN PARAMETER, AND THE OWNER SHALL ACCEPT ALL RISKS ASSOCIATED WITH DAMAGE TO THE STRUCTURE AS A RESULT OF EXPANSIVE, COMPRESSIBLE, SHIFTING AND/OR DIFFERENTIAL MOVEMENT AS A RESULT OF DIFFERING SUBGRADE CONDITIONS BETWEEN EXISTING AND NEW FOUNDATION ELEMENTS.

FROST DEPTH	36"
PRESUMPTIVE LOAD-BEARING PRESSURE	2000 psf

MATERIAL SPECIFICATIONS

STEEL MATERIAL SPECIFICATIONS	
STEEL MEMBERS	**MATERIAL**
WIDE FLANGE SHAPES (W)	ASTM A992
CHANNELS (C), ANGLES (L)	ASTM A36
PLATES	ASTM A36
HOLLOW STRUCTURAL SHAPES (HSS)	ASTM A500, GRADE C
HIGH STRENGTH BOLTS	ASTM F3125, GRADE A325
ANCHOR BOLTS (HEX-HEAD UNO)	ASTM F1554 (55 ksi) "S1"
EPOXY ANCHOR RODS	ASTM A36
STEEL DECK, PLAIN STEEL	ASTM A1008, (33 ksi)
STEEL DECK, GALVANIZED	ASTM A653, (33 ksi)
NON-SHRINK GROUT, COL. BASES	5000 psi (28 DAY STRENGTH)

CONCRETE & REINFORCING STEEL SPECIFICATIONS	
MATERIAL	**SPECIFICATION**
REINFORCING BARS	ASTM A615, GRADE 60
WELDED REBAR	ASTM A706
WELDED WIRE FABRIC	ASTM A1064
PORTLAND CEMENT	ASTM C 150
FLY ASH	ASTM C 618, 15% MAX
CONCRETE AGGREGATES	ASTM C 33, 3/4" MAX AGG. SIZE.
EPOXY - THREADED ROD ANCHORS	HILTI HIT-HY 200 A OR SIMPSON SET 3G
EPOXY - REINFORCING BARS	HILTI HIT-HY 200 R OR SIMPSON SET 3G
REBAR CONDITION	**MINIMUM CONCRETE COVER**
FORMED SURFACES EXPOSED TO GROUND OR WEATHER	2"
UNFORMED SURFACE IN CONTACT WITH THE GROUND	3"
WALLS AND SLABS NOT EXPOSED TO GROUND OR WEATHER	1"
INTERIOR BEAMS AND COLUMNS (TO TIES OR STIRRUPS)	1 1/2"

CONCRETE MIX DESIGN REQUIREMENTS

CONCRETE USE	WEIGHT	28 DAY f'c	CEMENT TYPE	MAX W/C RATIO	SLUMP (+/- 1")	% AIR
FOOTINGS/PIERS	NW	3500 psi	I/II	0.55	5"	6% MAX
FOUNDATION WALLS	NW	3500 psi	I/II	0.50	4"	6% +/- 1%
INT. SLAB-ON-GRADE	NW	4000 psi	I/II	0.45	5"	3% MAX
ELEVATED SLABS	NW	5000 psi	I/II	0.45	5"	1.5% +/-
TILT-UP WALLS	NW	4000 psi	I/II	0.45	4"	5% +/- 1.5%

CONCRETE SLAB SPECIFICATIONS	
FLOOR FLATNESS, F_F	SOV: 35 | MLV: 25
FLOOR LEVELNESS, F_L	SOV: 24 | MLV: 17

SHEET LIST - STRUCTURAL

SHEET NUMBER	SHEET NAME
S100	GENERAL NOTES AND SPECIFICATIONS
S110	SPECIAL INSPECTIONS
S200	FOUNDATION PLAN
S500	TYPICAL FOUNDATION DETAILS
S501	TYPICAL FOUNDATION DETAILS

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www.apex-engineers.com

a new development for
D-Bats

520 NE Town Centre Drive
LEE'S SUMMIT, MO

date
Issue Date
drawn by
JMB
checked by
BDC
revisions
△

STATE OF MISSOURI
BRYCE D. CRAM
NUMBER PE-2006026494
2022.05.19
PROFESSIONAL ENGINEER

sheet number
S100

drawing type
Project Status
project number
Project Number

SCHEDULE - CONCRETE REBAR

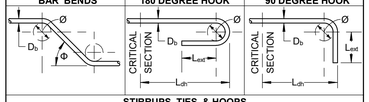
DEVELOPMENT LENGTHS - L_d

	f'c = 3000 PSI				f'c = 4000 PSI			
BAR SIZE	STD. L_d		CLASS B		BAR SIZE	STD. L_d		CLASS B	
	TYP.	TOP	TYP.	TOP		TYP.	TOP	TYP.	TOP
#3	17"	22"	22"	28"	#3	15"	19"	19"	25"
#4	22"	29"	29"	38"	#4	19"	25"	25"	33"
#5	28"	36"	37"	47"	#5	24"	31"	32"	41"
#6	33"	43"	43"	56"	#6	29"	37"	38"	49"
#7	48"	63"	63"	82"	#7	42"	54"	55"	71"
#8	55"	72"	72"	94"	#8	48"	62"	63"	81"
#9	62"	81"	81"	106"	#9	54"	70"	71"	91"

STANDARD HOOKS & BAR BENDS

	f'c = 3000 PSI				f'c = 4000 PSI				
BAR SIZE	L_{dh}	"Ø"	L_{ext}		BAR SIZE	L_{dh}	"Ø"	L_{ext}	
			180	90				180	90
#3	6"	2 1/4"	2 1/2"	4 1/2"	#3	6"	2 1/4"	2 1/2"	4 1/2"
#4	8"	3"	2 1/2"	6"	#4	7"	3"	2 1/2"	6"
#5	10"	3 3/4"	2 1/2"	7 1/2"	#5	9"	3 3/4"	2 1/2"	7 1/2"
#6	12"	4 1/2"	3"	9"	#6	10"	4 1/2"	3"	9"
#7	14"	5 1/4"	3 1/2"	10 1/2"	#7	12"	5 1/4"	3 1/2"	10 1/2"
#8	16"	6"	4"	12"	#8	14"	6"	4"	12"
#9	18"	9"	4 1/2"	13 1/2"	#9	15"	9"	4 1/2"	13 1/2"

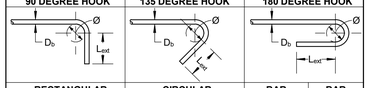
BAR BENDS | 180 DEGREE HOOK | 90 DEGREE HOOK



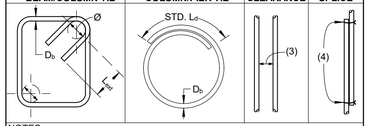
STIRRUPS, TIES, & HOOPS

		L_{ext}					L_{ext}		
BAR SIZE	Ø	90	135	180	BAR SIZE	Ø	90	135	180
#3	1 1/2"	3"	3"	2 1/2"	#6	4 1/2"	9"	4 1/2"	3"
#4	2"	3"	3"	2 1/2"	#7	5 1/4"	10 1/2"	5 1/4"	3 1/2"
#5	2 1/2"	3 3/4"	3 3/4"	2 1/2"	#8	6"	12"	6"	4"

90 DEGREE HOOK | 135 DEGREE HOOK | 180 DEGREE HOOK



RECTANGULAR BEAM/COLUMN TIE | CIRCULAR COLUMN/PIER TIE | BAR CLEARANCE | BAR SPLICE



NOTES:
1. USE THE ABOVE TABLE UNLESS NOTED OTHERSIZE ON PLAN OR IN DETAILS.
2. PROVIDE 6" LAP AT ALL WELDED WIRE FABRIC JOINTS.
3. PROVIDE 1 D_b (1" MINIMUM) CLEARANCE BETWEEN ADJACENT BARS.
4. PROVIDE WIRE TIES AT EACH END OF BAR SPLICE.
5. DO NOT PROVIDE CLASS A SPLICE UNLESS SPECIFICALLY DETAILED.

SCHEDULE - PAD FOOTING

MARK	LENGTH	WIDTH	DEPTH	REINFORCING
F4.5	4' - 6"	4' - 6"	3' - 0"	(12) #5 EACH WAY [(6) AT T&B]
F5	5' - 0"	5' - 0"	3' - 0"	(14) #5 EACH WAY [(7) AT T&B]
F6.5	6' - 6"	6' - 6"	3' - 0"	(18) #5 EACH WAY [(9) AT T&B]
F7.5	7' - 6"	7' - 6"	4' - 0"	(26) #5 EACH WAY [(13) AT T&B]

SCHEDULE - CONTINUOUS FOOTING

MARK	WIDTH	DEPTH	LONG BARS	TRANS BARS
CF16	1' - 4"	36"	(4) #4 CONT [(2) AT T&B]	#3 TIES AT 18" OC
CF27	2' - 3"	36"	(4) #4 CONT [(2) AT T&B]	#3 TIES AT 18" OC

SCHEDULE - SLAB ON GRADE

MARK	SLAB THICKNESS	WEIGHT CLASS	SLAB REINFORCING	ADDITIONAL REQUIREMENTS
SG4	4"	NW	#3 AT 18"OC EA WAY OR 6X6 W2.9XW2.9 WWF	10 MIL. VAPOR BARRIER ON 4" OF 3/4" CLEAN, GRADED ROCK.

SDI TABLE 1.1

INSPECTION OR EXECUTION TASKS PRIOR TO DECK PLACEMENT:

TASK	QC	QA
A. VERIFY COMPLIANCE OF MATERIALS (DECK AND ALL DECK ACCESSORIES) WITH CONSTRUCTION DOCUMENTS, INCLUDING PROFILES, MATERIAL PROPERTIES, AND BASE METAL THICKNESS.	P	P
B. DOCUMENT ACCEPTANCE OR REJECTION OF DECK AND DECK ACCESSORIES.	P	P

SDI TABLE 1.2

INSPECTION OR EXECUTION TASKS AFTER DECK PLACEMENT

TASK	QC	QA
A. VERIFY COMPLIANCE OF DECK AND ALL DECK ACCESSORIES INSTALLATION WITH CONSTRUCTION DOCUMENTS.	P	P
B. VERIFY DECK MATERIALS ARE REPRESENTED BY THE MILL CERTIFICATIONS THAT COMPLY WITH THE CONSTRUCTION DOCUMENTS.	N/A	P
C. DOCUMENT ACCEPTANCE OR REJECTION OF INSTALLATION OF DECK AND DECK ACCESSORIES.	P	P

SDI TABLE 1.3

INSPECTION OR EXECUTION TASKS PRIOR TO WELDING

TASK	QC	QA
A. WELDING PROCEDURE SPECIFICATIONS (WPS) AVAILABLE.	O	O
B. MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE.	O	O
C. MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O
D. CHECK WELDING EQUIPMENT.	O	O

SDI TABLE 1.4

INSPECTION OR EXECUTION TASKS DURING WELDING

TASK	QC	QA
A. USE OF QUALIFIED WELDERS.	O	O
B. CONTROL AND HANDLING OF WELDING CONSUMABLES.	O	O
C. ENVIRONMENTAL CONDITIONS (WIND SPEED, MOISTURE, TEMPERATURE)	O	O
D. WPS FOLLOWED	O	O

SDI TABLE 1.5

INSPECTION OR EXECUTION TASKS AFTER WELDING

TASK	QC	QA
A. VERIFY SIZE AND LOCATION OF WELDS, INCLUDING SUPPORT, SIDELAP, AND PERIMETER WELDS.	P	P
B. WELDS MEET VISUAL ACCEPTANCE CRITERIA.	P	P
C. VERIFY REPAIR ACTIVITIES.	P	P
D. DOCUMENT ACCEPTANCE OR REJECTION OF WELDS.	P	P

SDI TABLE 1.6

INSPECTION OR EXECUTION TASKS PRIOR TO MECHANICAL FASTENING

TASK	QC	QA
A. MANUFACTURER INSTALLATION INSTRUCTIONS AVAILABLE FOR MECHANICAL FASTENERS.	O	O
B. PROPER TOOLS AVAILABLE FOR FASTENER INSTALLATION.	O	O
C.PROPER STORAGE FOR MECHANICAL FASTENERS.	O	O

SDI TABLE 1.7

INSPECTION OR EXECUTION TASKS DURING MECHANICAL FASTENING

TASK	QC	QA
A. FASTENERS ARE POSITIONED AS REQUIRED.	O	O
B. FASTENERS ARE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.	O	O

SDI TABLE 1.8

INSPECTION OR EXECUTION TASKS AFTER MECHANICAL FASTENING

TASK	QC	QA
A. CHECK SPACING, TYPE, AND INSTALLATION OF SUPPORT FASTENERS.	P	P
B. CHECK SPACING, TYPE, AND INSTALLATION OF SIDELAP FASTENERS.	P	P
C. CHECK SPACING, TYPE, AND INSTALLATION OF PERIMETER FASTENERS.	P	P
D. VERIFY REPAIR ACTIVITIES.	P	P
E. DOCUMENT ACCEPTANCES OR REJECTION OF MECHANICAL FASTENERS.	P	P

AISC TABLE N5.4-1

INSPECTION TASKS PRIOR TO WELDING	QC	QA
1. WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE	P	P
2. MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	P	P
3. MATERIAL IDENTIFICATION (TYPE/GRADE)	O	O
4. WELDER IDENTIFICATION SYSTEM[1]	O	O
5. FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY) • JOINT PREPARATION • DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION) • BACKING TYPE AND FIT (IF APPLICABLE)	O	O
6. CONFIGURATION AND FINISH OF ACCESS HOLES	O	O
7. FIT-UP OF FILLET WELDS • DIMENSIONS (ALIGNMENT, GAPS AT ROOT) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION)	O	O
8. CHECK WELDING EQUIPMENT	O	-

[1] THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE

AISC TABLE N5.4-2

INSPECTION TASKS DURING WELDING	QC	QA
1. USE OF QUALIFIED WELDERS	O	O
2. CONTROL AND HANDLING OF WELDING CONSUMABLES • PACKAGING • EXPOSURE CONTROL	O	O
3. NO WELDING OVER CRACKED TACK WELDS	O	O
4. ENVIRONMENTAL CONDITIONS • WIND SPEED WITHIN LIMITS • PRECIPITATION AND TEMPERATURE	O	O
5. WPS FOLLOWED • SETTINGS ON WELDING EQUIPMENT • TRAVEL SPEED • SELECTED WELDING MATERIALS • SHIELDING GAS TYPE/FLOW RATE • PREHEAT APPLIED • INTERPASS TEMPERATURE MAINTAINED (MIN./MAX.) • PROPER POSITION (F, V, H, OH)	O	O
6. WELDING TECHNIQUES • INTERPASS AND FINAL CLEANING • EACH PASS WITHIN PROFILE LIMITATIONS • EACH PASS MEETS QUALITY REQUIREMENTS	O	O

AISC TABLE N5.4-3

INSPECTION TASKS AFTER WELDING	QC	QA
1. WELDS CLEANED	O	O
2. SIZE, LENGTH AND LOCATION OF WELDS	P	P
3. WELDS MEET VISUAL ACCEPTANCE CRITERIA • CRACK PROHIBITION • WELD/BASE-METAL FUSION • CRATER CROSS SECTION • WELD PROFILES • WELD SIZE • UNDERCUT • POROSITY	P	P
4. ARC STRIKES	P	P
5. K-AREA[1]	P	P
6. BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	P
7. REPAIR ACTIVITIES	P	P
8. DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	P	P

[1] WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE K-AREA, VISUALLY INSPECT THE WEB K-AREA FOR CRACKS WITHIN 3 IN. (75 MM) OF THE WELD

AISC TABLE N5.6-1

INSPECTION TASKS PRIOR TO BOLTING	QC	QA
1. MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	O	P
2. FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	O	O
3. PROPER FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO BE EXCLUDED FROM SHEAR PLANE)	O	O
4. PROPER BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	O	O
5. CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	O	O
6. PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	P	O
7. PROPER STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS	O	O

AISC TABLE N5.6-2

INSPECTION TASKS DURING BOLTING	QC	QA
1. FASTENER ASSEMBLIES, OF SUITABLE CONDITION, PLACED IN ALL HOLES AND WASHERS (IF REQUIRED) ARE POSITIONED AS REQUIRED	O	O
2. JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION	O	O
3. FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	O
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	O	O

AISC TABLE N5.6-3

INSPECTION TASKS AFTER BOLTING	QC	QA
1. DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	P	P

AISC TABLE N6.1

INSPECTION OF STEEL ELEMENTS OF COMPOSITE CONSTRUCTION PRIOR TO CONCRETE PLACEMENT	QC	QA
1. PLACEMENT AND INSTALLATION OF STEEL DECK	P	P
2. PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS	P	P
3. DOCUMENT ACCEPTANCE OR REJECTION OF STEEL ELEMENTS	P	P

STATEMENT OF SPECIAL INSPECTION

IBC CODE REFERENCE	CONSTRUCTION TYPE	FREQUENCY CONT.	FREQUENCY PER.
1705.2	**STEEL CONSTRUCTION**		
1705.2.1	**STRUCTURAL STEEL**		
1. SPECIAL INSPECTION FOR STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF AISC 360. **(REFER TO AISC CHARTS ON THIS SHEET)**			
1705.2.2	**COLD-FORMED STEEL DECK**		
1. SPECIAL INSPECTIONS AND QUALIFIACTIONS OF WELDING SPECIAL INSPECTORS FOR COLD-FORMED STEEL FLOOR AND ROOF DECK SHALL BE IN ACCORDANCE WITH THE QUALITY ASSURANCE INSPECTION REQUIREMENTS OF SDI QA/QC. **(REFER TO SDI CHARTS ON THIS SHEET)**			
1705.2.3	**OPEN-WEB STEEL JOIST AND JOIST GIRDERS**		
1. INSTALLATION OF OPEN-WEB STEEL JOISTS AND JOIST GIRDERS:			
A. END CONNECTIONS - WELDING OR BOLTED			X
B. BRIDGING - HORIZONTAL OR DIAGONAL			
1. STANDARD BRIDGING			X
2. BRIDGING THAT DIFFERS FROM THE SJI SPECIFICATIONS LISTED IN SECTION 2207.1			X
1705.3	**REINFORCED CONCRETE**		
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT.			X
2. INSPECTION OF REINFORCING STEEL WELDING:			
A. VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.			X
B. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16"			X
C. INSPECT ALL OTHER WELDS	X		
3. INSPECTION OF ANCHORS CAST IN CONCRETE:			X
4. INSPECTION OF ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.			
A. ADHESIVE ANCHORS INSTALLED IN HOIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS.	X		
B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4.A			X
5. VERIFYING USE OF REQUIRED MIX DESIGN			X
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFOR SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X		
7. INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X		
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.			X
9. INSPECTION OF PRESTRESSED CONCRETE:			
A. APPLICATION OF PRESTRESSING FORCES.	X		
B. GROUTING OF BONDED PRESTRESSING TENDONS IN THE SEISMIC-FORCE-RESISTING SYSTEM.	X		
10. ERECTION OF PRECAST CONCRETE MEMBERS.			X
11. VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORING.			X
12. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED			X
SPECIAL INSPECTION AGENCY TO PERFORM TESTS AT SEVEN (7) DAYS AND AT TWENTY EIGHT (28) DAYS. A STRENGTH TEST SHALL BE THE AVERAGE OF THE STRENGTHS OF AT LEAST TWO (2) 6"x12" CYLINDERS OR AT LEAST THREE (3) 4"x8" CYLINDERS MADE FROM THE SAME SAMPLE OF CONCRETE. HOLD ONE ADDITIONAL CYLINDER IN RESERVE UNTIL PROJECT IS COMPLETED. TESTING LABORATORY IS TO FURNISH ARCHITECT/ENGINEER WITH TEST RESULTS PROMPTLY.			
FREQUENCY OF TESTING IS TO BE IN ACCORDANCE WITH ACI 318:			
A. ONCE EACH DAY A GIVEN CLASS IS PLACED, NOR LESS THAN.			
B. ONCE FOR EACH 150 CUBIC YDS OF EACH CLASS PLACED EACH DAY, NOR LESS THAN.			
C. ONCE FOR EACH 5000 SQFT OR SLAB WALL OR SURFACE AREA PLACED EACH DAY.			
1705.6	**SOILS**		
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.			X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.			X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.			X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X		
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.			X
1705.8	**CAST-IN-PLACE DEEP FOUNDATIONS**		
1. OBSERVE DRILLING OPERATIONS AND MAINTAIN COMPLETE AND ACCURATE RECORDS FOR EACH ELEMENT.	X		
2. VERIFY PLACEMENT LOCATIONS AND PLUMBNESS, CONFIRM ELEMENT DIAMETERS, BELL DIAMETERS (IF APPLICABLE), LENGTHS, EMBEDMENT INTO BEDROCK (IF APPLICABLE) AND ADEQUATE END-BEARING STRATA CAPACITY. RECORD CONCRETE OR GROUT VOLUMES.	X		
1705.11.2	**COLD-FORMED STEEL FRAMING**		
1. MATERIAL VERIFICATION:			
A. MEMBER SIZE AND THICKNESS TO MATCH CONTRACT DOCUMENTS INCLUDING TRACKS, STUDS, ASSEMBLIES, CONNECTORS.			X
B. FASTENER MATERIAL AND COMPONENTS			X
2. INSPECTION OF INISTALLATION			
A. INSPECT MEMBER LAYOUT, CONNECTION, ORIENTATION			X
B. SPECIAL INSPECTION REQUIRED FOR FASTENERS PER MANUFACTURER.			X
C. INSPECTION PRIOR TO SHEATHING: VERIFY FLANGES ARE INTACT, STUDS ARE NOT CUT OR SPLICED.			X
3. INSPECTION OF WELDING.			X
1705.14	**SPRAYED FIRE-RESISTANT MATERIALS**		
1. STRUCTURAL MEMBER SURFACE CONDITIONS.			X
2. APPLICATION.			X
3. THICKNESS.			X
4. DENSITY.			X
5. BOND STRENGTH.			X

RELEASED FOR CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
06/23/2022

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BRYCE D. CRABB
NUMBER PE-2006026494
2022.05.19
PROFESSIONAL ENGINEER

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Project Status
project number
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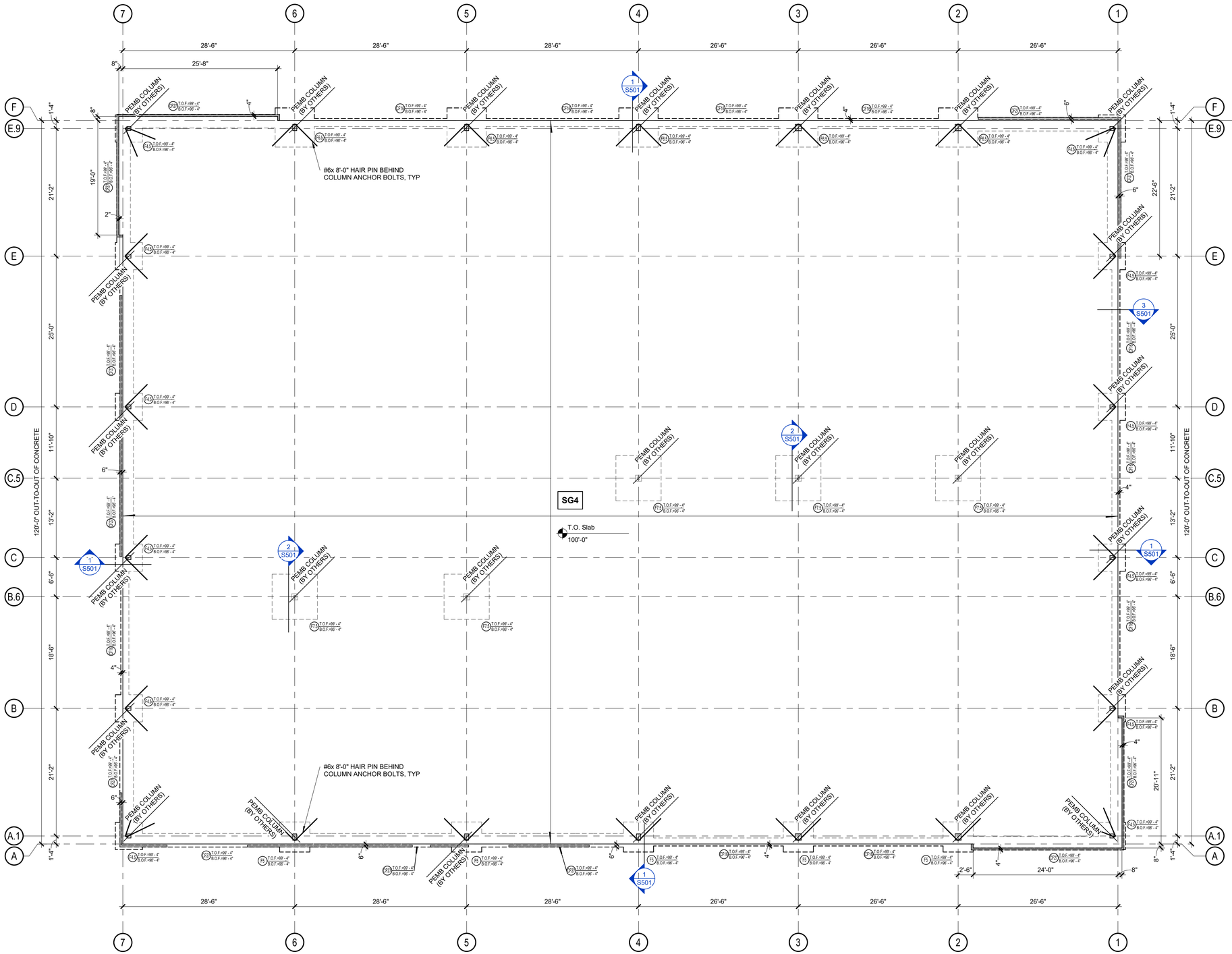

FOUNDATION PLAN

1/8" = 1'-0"

PLAN NOTES - FOUNDATIONS

1. PROVIDE CONTROL JOINTS (1/4 SLAB DEPTH) AT 10'-0" OC BOTH WAYS, NOT SHOWN FOR CLARITY.
2. CONTRACTOR TO VERIFY ALL FOUNDATION ELEVATIONS AND STEPS PER SITE CONDITIONS.
3. TOP OF SLAB ELEVATION SHOWN IN PLAN IS FOR REFERENCE ONLY.
4. REFERENCE ARCHITECTURAL DRAWINGS FOR WALL OPENING DIMENSIONS, EXTERIOR FINISHES AND ADDITIONAL NOTES.
5. REFERENCE GENERAL NOTES SHEET FOR ADDITIONAL FOUNDATION SPECIFICATIONS.
6. CONTRACTOR TO CONTACT APEX ENGINEERS, INC AT LEAST 48 HRS IN ADVANCE OF ANY CONCRETE POUR.
7. INDICATES STONE FACADE, REF ARCH.

SCHEDULE - PAD FOOTING

MARK	LENGTH	WIDTH	DEPTH	REINFORCING
F4.5	4' - 6"	4' - 6"	3' - 0"	(12) #5 EACH WAY [(6) AT T&B]
F5	5' - 0"	5' - 0"	3' - 0"	(14) #5 EACH WAY [(7) AT T&B]
F6.5	6' - 6"	6' - 6"	3' - 0"	(18) #5 EACH WAY [(9) AT T&B]
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KEYNOTE LEGEND

KEYNOTE	COMMENT

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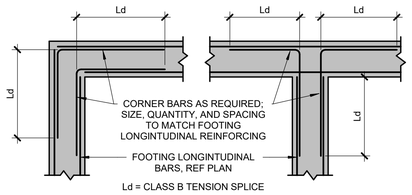
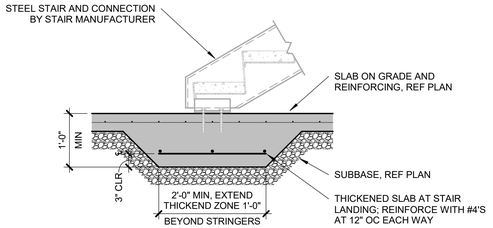
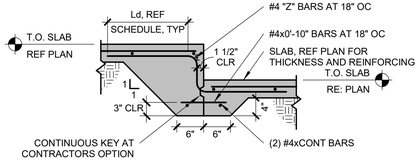


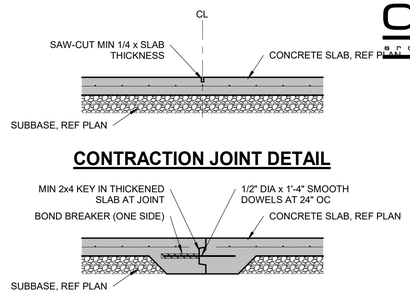
16 TYP FOUNDATION CORNER DETAIL
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



12 TYPICAL THICKENED SLAB AT STEEL STAIR LANDING
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



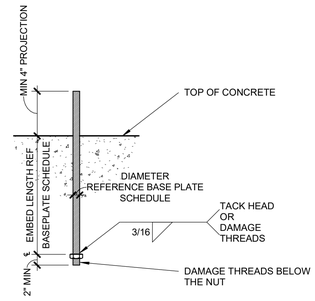
8 TYP CONCRETE SLAB ON GRADE STEP
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



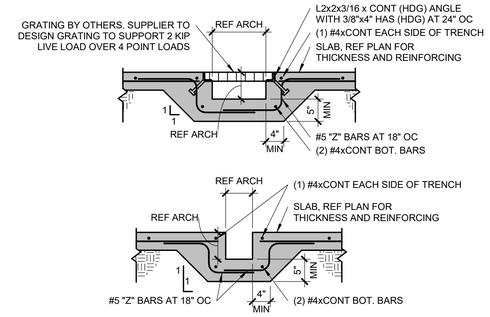
CONTRACTION JOINT DETAIL

CONSTRUCTION JOINT DETAIL

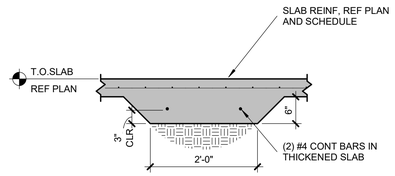
4 SLAB ON GRADE CONTROL JOINT
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



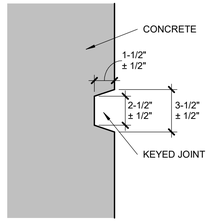
14 TYP ANCHOR BOLT
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



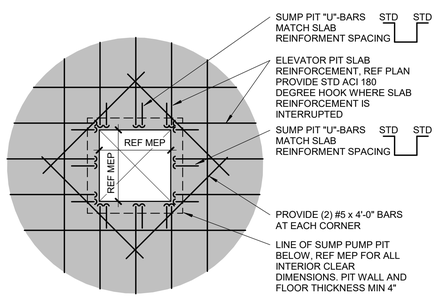
11 TYP SLAB AT TRENCH
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



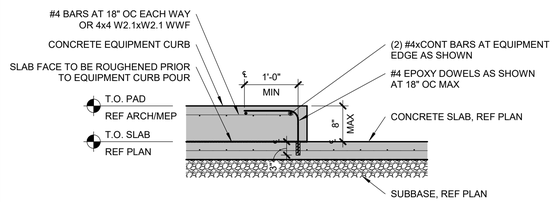
7 TYPICAL THICKENED SLAB ON GRADE
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



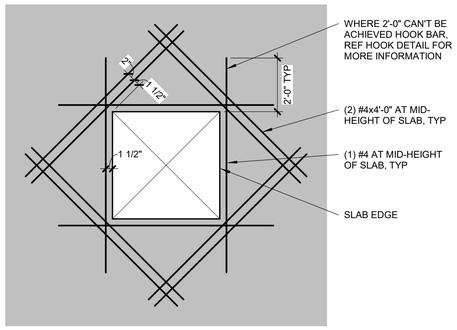
3 TYP KEY IN CONCRETE
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



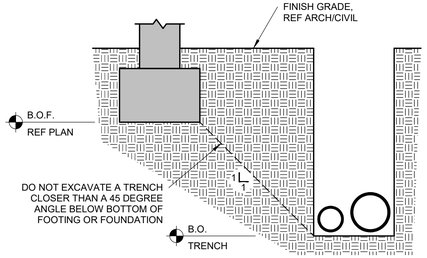
15 TYPICAL SUMP PIT REINFORCEMENT
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



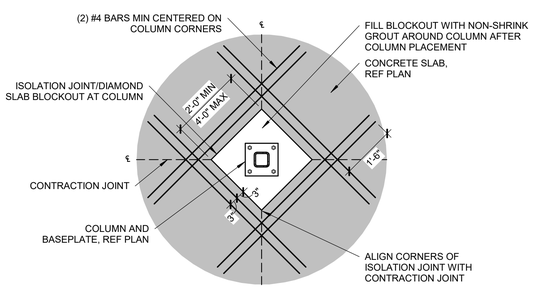
10 TYPICAL SOG EQUIPMENT PAD
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



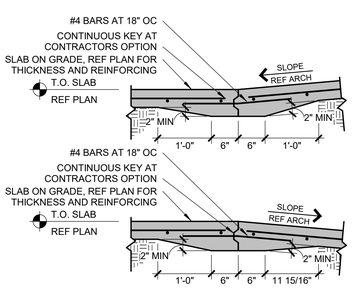
6 TYP OPENING IN CONCRETE SLAB ON GRADE
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



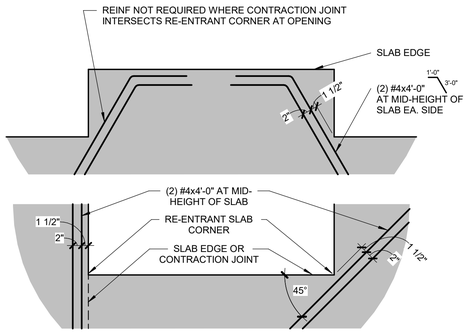
2 MAXIMUM SLOPE BETWEEN FOUNDATION AND TRENCH
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



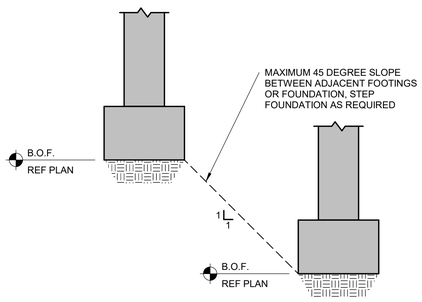
13 TYP COLUMN ISOLATION JOINT
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



9 SLAB ON GRADE AT RAMP
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



5 TYP RE-ENTRANT CORNER IN CONCRETE SLAB
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*



1 MAXIMUM SLOPE BETWEEN ADJACENT FOUNDATIONS
S500 | NO SCALE | *THIS DETAIL IS TYPICAL TO THE PROJECT AND MAY NOT BE CUT OR CALLED OUT ON PLANS*

STATE OF MISSOURI
BRYCE A. GRAY
NUMBER PE-2006026494
2022.05.19
PROFESSIONAL ENGINEER

a new development for
D-Bats

520 NE Town Centre Drive
LEE'S SUMMIT, MO

date
Issue Date
drawn by
JMB
checked by
BDC
revisions

sheet number
S500

drawing type
Project Status
project number
Project Number

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1625 LOCUST ST
KANSAS CITY, MO 64108
816.421.3222
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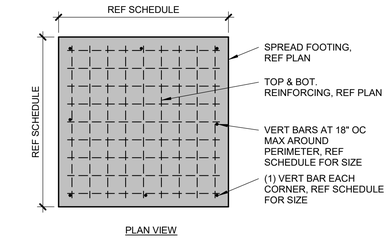
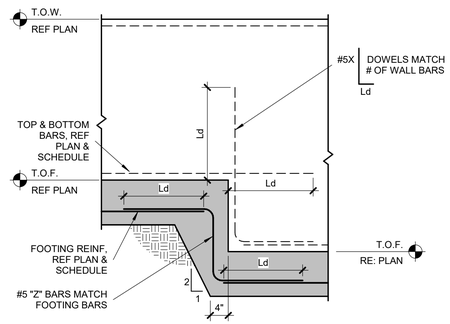
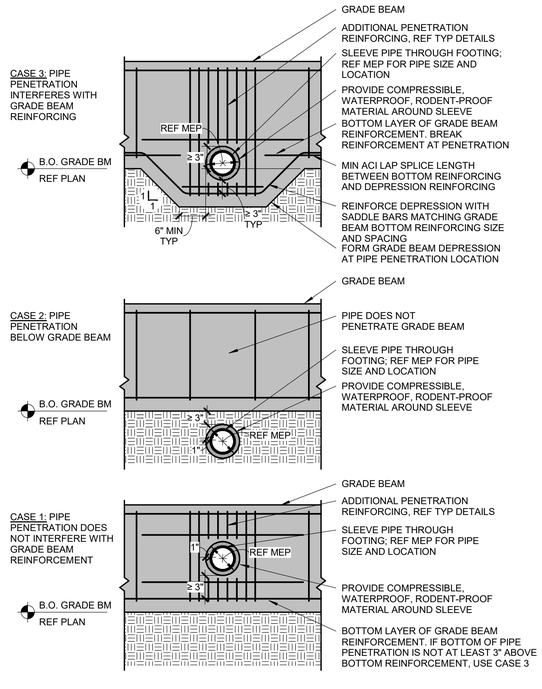


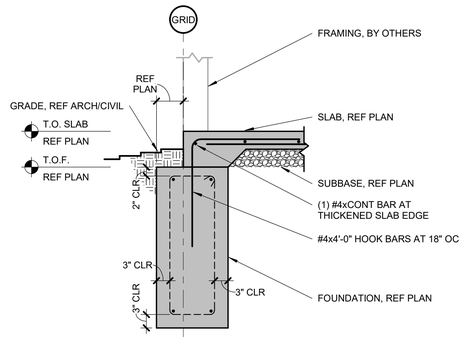
9 TYP DEEP SPREAD FOOTING VERTICAL REINFORCING
S501 | 3/4" = 1'-0"



8 FOUNDATION WALL FOOTING STEP
S501 | 3/4" = 1'-0"

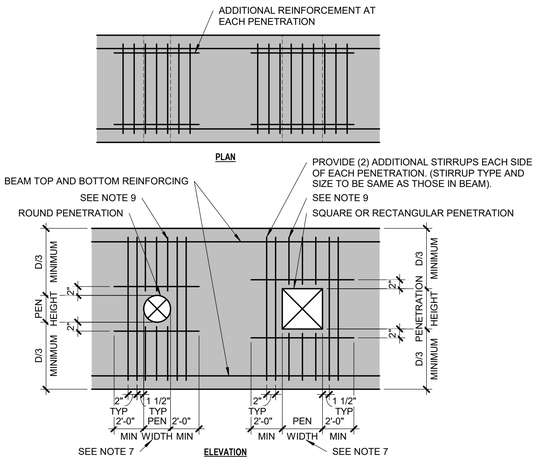


5 GRADE BEAM AT PIPE PENETRATION
S501 | 3/4" = 1'-0"

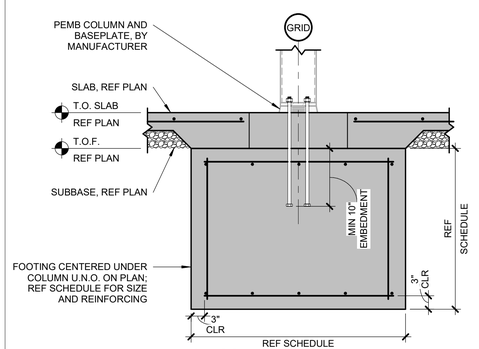


3 WOOD FRAMING ON CONTINUOUS FOOTING
S501 | 3/4" = 1'-0"

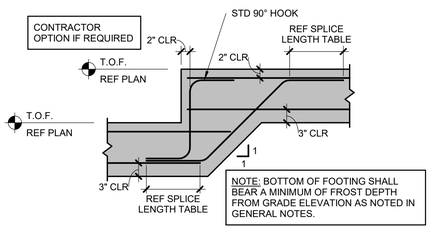
NOTES:
1. CONTRACTOR TO COORDINATE LOCATION, SIZE AND ELEVATION AND INCLUDE IN HIS CONTRACT PRICE ALL REQUIRED HORIZONTAL PENETRATIONS THROUGH CONCRETE BEAMS WHETHER SHOWN ON STRUCTURAL DRAWINGS OR NOT.
2. WHERE BEAM PENETRATIONS ARE REQUIRED BUT ARE NOT SPECIFICALLY DETAILED ON THE STRUCTURAL DRAWINGS, SUBMIT DRAWINGS, SHOWING DIMENSIONS AND LOCATIONS OF ALL REQUIRED PENETRATIONS, FOR REVIEW AND APPROVAL.
3. "D" DENOTES THE DEPTH OF BEAM.
4. CLEAR SPACING BETWEEN PENETRATIONS SHALL BE 24" MINIMUM UNLESS DESIGNED OTHERWISE BY THE ENGINEER.
5. PENETRATIONS SHALL BE LOCATED ACCORDING TO THE FOLLOWING CRITERIA:
   A. FOR BEAMS NOT SUPPORTING INTERSECTING BEAMS: LOCATE PENETRATIONS WITHIN TWO FEET EITHER SIDE OF BEAM MIDSPAN.
   B. FOR BEAMS SUPPORTING INTERSECTING BEAMS: CHECK WITH STRUCTURAL ENGINEER
6. AT EACH SLEEVE, UNLESS REQUIRED OTHERWISE BY NOTE #7 BELOW, PROVIDE THE FOLLOWING:
   - (1) #5 TOP AND BOTTOM AT BEAMS WITH WIDTHS LESS THAN 9".
   - (2) #5 TOP AND BOTTOM AT BEAMS WITH (2) LEG STIRRUPS.
   - (4) #5 TOP AND BOTTOM AT BEAMS WITH (4) LEG STIRRUPS.
   - (N) #5 TOP AND BOTTOM AT BEAMS WITH (N) LEG STIRRUPS.
7. PENETRATION WIDTH <= PENETRATION DEPTH (UNLESS SHOWN OTHERWISE ON THE STRUCTURAL DRAWINGS).
8. FOR LOCATIONS AND/OR SIZES OF PENETRATIONS NOT CONFORMING TO THE ABOVE CRITERIA AND NOT OTHERWISE DETAILED ON THE STRUCTURAL DRAWINGS, CONTRACTOR SHALL COORDINATE REQUIRED ADDITIONAL REINFORCEMENT WITH THE ENGINEER ON THE SHOP DRAWINGS.
9. PROVIDE ADDITIONAL STIRRUPS AT SPACING NOT TO EXCEED ONE HALF OF THE SCHEDULED STIRRUP SPACING (UNLESS DETAILED OTHERWISE ON THE STRUCTURAL DRAWINGS).
10. SEPARATE THE UTILITIES PASSING THRU SLEEVES / PENETRATIONS TO ADEQUATELY ACCOMMODATE ANY POTENTIAL SWELL FROM THE ON-SITE SOILS.



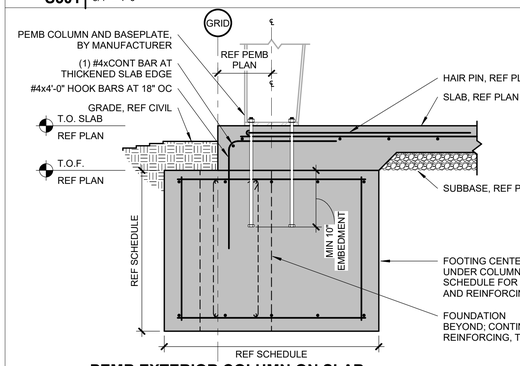
4 GRADE BEAM PIPE SLEEVE
S501 | 3/4" = 1'-0"



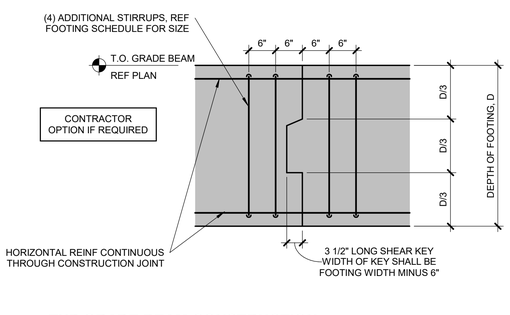
2 PEMB INTERIOR COLUMN SPREAD FOOTING
S501 | 3/4" = 1'-0"



7 TYP FOOTING STEP
S501 | 3/4" = 1'-0"



1 PEMB EXTERIOR COLUMN ON SLAB WITH CONTINUOUS FOOTING
S501 | 3/4" = 1'-0"



6 TYP GRADE BEAM CONSTRUCTION JOINT
S501 | 3/4" = 1'-0"

a new development for
D-Bats

520 NE Town Centre Drive
LEE'S SUMMIT, MO

date
Issue Date
drawn by
JMB
checked by
BDC
revisions

sheet number
S501

drawing type
Project Status

project number
Project Number

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. (MUST BE INSTALLED PER THE MANUFACTURERS REQUIREMENTS FOR PLENUM USE)
   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. (MUST BE INSTALLED PER THE MANUFACTURERS REQUIREMENTS FOR PLENUM USE)
   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. (MUST BE INSTALLED PER THE MANUFACTURERS REQUIREMENTS FOR PLENUM USE)

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.

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 FITINGS 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.

MECHANICAL SPECIFICATIONS (CONTINUED)

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. (NOT FOR USE IN A RETURN AIR PLENUM)
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. (NOT FOR USE IN A RETURN AIR PLENUM)
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).
2) DWV, WROUGHT COPPER, ANSI B-16.29 (WATER HEATER T&P).

I. REFRIGERANT.

1) ASTM B 280, TYPE ACR, HARD-DRAWN STRAIGHT LENGTHS, AND SOFT-ANNEALED COILS, SEAMLESS COPPER TUBING.
2) WROUGHT COPPER, ANSI B16.22, STREAMLINED PATTERN, FITTINGS. BRAZED JOINTS, AWS A 5.8, CLASSIFICATION BAG-1 (SILVER).
3) TUBING SHALL BE FACTORY CLEANED, READY FOR INSTALLATION, AND HAVE ENDS CAPPED TO PROTECT CLEANLINESS OF PIPE INTERIORS PRIOR TO SHIPPING.
4) SIZE AND INSTALLATION OF PIPE SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

J. 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 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.

K. 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.

L. 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.

M. 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 LIGHT HAZARD 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.

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.

MECHANICAL SPECIFICATIONS (CONTINUED)

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 QUICK RESPONSE HEADS WITH NOMINAL 1/2 INCH DISCHARGE ORIFICE, FOR "LIGHT HAZARD" 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"
d) REFRIGERANT SUCTION	3/4" FOR PIPING UP TO 1-1/4"Φ, & 1" FOR PIPING 1-1/2"Φ AND LARGER

C. EQUIPMENT INSULATION:

1) FLEXIBLE FIBERGLASS: GLASS FIBER INSULATION, ASTM C 553, TYPE 1, CLASS B-4, SEMI-RIGID BOARD, WITH FACTORY LAMINATED KRAFT ALUMINUM FOIL (ALL SERVICE JACKET), VAPOR BARRIER, OWENS/CORNING PIPE AND TANK INSULATION.

D. 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.
(3) SOUND BOOTS	1"

E. 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"
(4) MAKE-UP AIR DUCT	2"
(4) OUTDOOR AIR	2"

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

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.

4) DUCT COVERING (EXTERIOR SUPPLY AND RETURN)
   a) EXTERIOR INSULATION: JOHN MANVILLE XSPECT ISOFOAM APF BOARD, 1-1/2" THICK R-9.3, UNIFORM CLOSED-CELL POLYISOCYANURATE FOAM CORE BONDED WITH A FOIL FACER. INSTALLED PER MANUFACTURER'S REQUIREMENTS. COVER ISOFOAM BOARD INSULATION WITH POLYGUARD ALUMAGUARD, COMPOSITE MEMBRANE MULTI-PLY EMBOSSED UV-RISISTANT ALUMINUM FOIL/POLYMER LAMINATE, ALL WEATHER FLEXIBLE WEATHER-PROOFING JACKET. MINIMUM R-8 RATING. MINIMUM R-12 CLIMATE ZONES 5-8.

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.

MECHANICAL SPECIFICATIONS (CONTINUED)

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

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. FLUE FOR GAS FIRED CONDENSING WATER HEATER OR FURNACE SHALL BE AS RECOMMENDED BY THE GAS APPLIANCE MANUFACTURER. FLUES SHALL BE SCHEDULE 40, PVC OR CPVC PIPE PER THE MANUFACTURERS INSTALLATION REQUIREMENTS.

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 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. FURNACE AND CONDENSING UNIT:

A. CONDENSING FURNACES:

1) GAS FIRED FURNACE SHALL BE FACTORY ASSEMBLED, PRE-WIRED UNIT CONSISTING OF SHEETMETAL CASING, SUPPLY FAN, GAS FIRED HEAT EXCHANGER, AND CONTROLS. CAPACITY SHALL BE AS SCHEDULED.

2) THE PRIMARY HEAT EXCHANGER SHALL BE ALUMINIZED STEEL CONSTRUCTION WITH A STAINLESS STEEL SECONDARY HEAT EXCHANGER.

3) THE FURNACE SHALL BE OF THE CONDENSING TYPE, UTILIZING A SEALED COMBUSTION CHAMBER. UNIT SHALL INCLUDE FINNED CAST IRON HEAT EXCHANGER, ALUMINIZED STEEL EXHAUST DECOUPLER SECTION, AND FINNED STAINLESS STEEL TUBE CONDENSER SECTION.

4) THE UNIT SHALL BE EQUIPPED WITH THE MANUFACTURER'S STANDARD CONTROLS INCLUDING 24 VOLT CONTROL TRANSFORMER, AUTOMATIC SPARK IGNITION, AUTOMATIC GAS VALVE TRAIN, HIGH TEMPERATURE LIMIT SWITCH, AND FAN TIMED DELAY RELAY.

5) RETURN AIR INLET ON UNIT SHALL BE PROVIDED WITH A 1" THROWAWAY TYPE FILTER AND SLIDE IN FRAME, MOUNTED ON THE UNIT.

6) FAN SHALL BE A DIRECT DRIVE MULTI-SPEED BLOWER, RESILIENTLY MOUNTED IN THE CASING. MOTOR SHALL BE PROVIDED WITH AUTOMATIC THERMAL OVERLOAD PROTECTION.

7) FURNACE SHALL BE AGA APPROVED.

B. CONDENSING UNIT SHALL BE FACTORY-ASSEMBLED AND TESTED AIR-COOLED CONDENSING UNIT, CONSISTING OF COMPRESSOR, CONDENSER COIL, FAN, MOTOR, REFRIGERANT RESERVOIR, OPERATING CONTROLS, ETC. CAPACITY AND ELECTRICAL CHARACTERISTICS SHALL BE AS SCHEDULED.

1) COMPRESSOR: HERMETICALLY SEALED WITH BUILT-IN OVERLOADS AND VIBRATION ISOLATION. COMPRESSOR MOTOR, SHALL HAVE THERMAL AND CURRENT SENSITIVE OVERLOAD DEVICES, INTERNAL HIGH-PRESSURE PROTECTION, HIGH AND LOW PRESSURE CUTOUT SWITCHES, START CAPACITOR AND RELAY, 2-POLE CONTACTOR, CRANKCASE HEATER, AND TEMPERATURE ACTUATED SWITCH AND TIMER TO PREVENT COMPRESSOR RAPID CYCLE.

2) COIL SHALL BE COPPER TUBING WITH ALUMINUM FINS; COMPLETE WITH LIQUID ACCUMULATOR AND LIQUID SUBCOOLER. UNIT SHALL INCLUDE FILTER DRYER, SIGHT GLASS, COMPRESSOR SERVICE VALVE, LIQUID LINE SERVICE VALVE, AND REFRIGERANT PIPING EXTENDED TO EXTERIOR OF CASING.

17. SMOKE DETECTORS:

A. UNITS MOUNTED IN THE DUCTWORK SHALL BE A DUCT MOUNTED UL LISTED PHOTO-ELECTRIC SELF-CONTAINED SMOKE DETECTOR WITH HOUSING. UNITS SHALL BE EQUAL TO SIMPLEX #4098-9687. THE SAMPLING TUBE SHALL BE #2098-9804, LENGTH AS REQUIRED FOR DUCT.

B. DUCT DETECTOR REMOTE TEST STATION SHALL BE SIMPLEX #4098-9842 WITH REMOTE ALARM INDICATOR, POWER-ON INDICATOR, TONE-ALERT, TONE-ALERT SILENCE SWITCH, AND TEST/RESET SWITCH.

1) DEVICES SHALL BE MOUNTED IN APPROVED LOCATION AS INDICATED ON THE FLOOR PLANS OR AS DIRECTED BY LOCAL AUTHORITY HAVING JURISDICTION.

C. PROVIDE AND INSTALL A PHOTO-ELECTRIC SMOKE DETECTOR IN THE RETURN AIR DUCT FOR EACH HVAC UNIT AS INDICATED ON THE FLOOR PLANS. DETECTORS ARE TO BE PROVIDED WITH A SUB-BASE CONTAINING AUXILIARY RELAY CONTACTS. RELAY CONTACTS SHALL BE WIRED INTO UNIT CONTROL WIRING, SO AS TO SHUT UNIT DOWN IN THE CASE OF SMOKE DETECTION. PROVIDE ALL CONTROL WIRING. ELECTRICAL CONTRACTOR SHALL PROVIDE 120 VOLT POWER TO EACH DETECTOR.

D. SMOKE DETECTORS SHALL BE INTERLOCKED. IN ALARM CONDITION OF A SINGLE DETECTOR ALL UNITS SHALL SHUT DOWN.

18. 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.

BC PROJECT #: 22323
MISSOURI PE COA #2009003629

BC ENGINEERS INCORPORATED
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RELEASED FOR CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
06/23/2022

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5/19/2022
MAXWELL T. APPLE
NUMBER PE-2018037493

a new development for
Town Centre Lot 1
520 NE Town Centre Drive
Lee's Summit, Missouri 64064

date
05.19.22
drawn by
MA/FS
checked by
EK/DS
revisions
△

sheet number
MP0.0

drawing type
permit

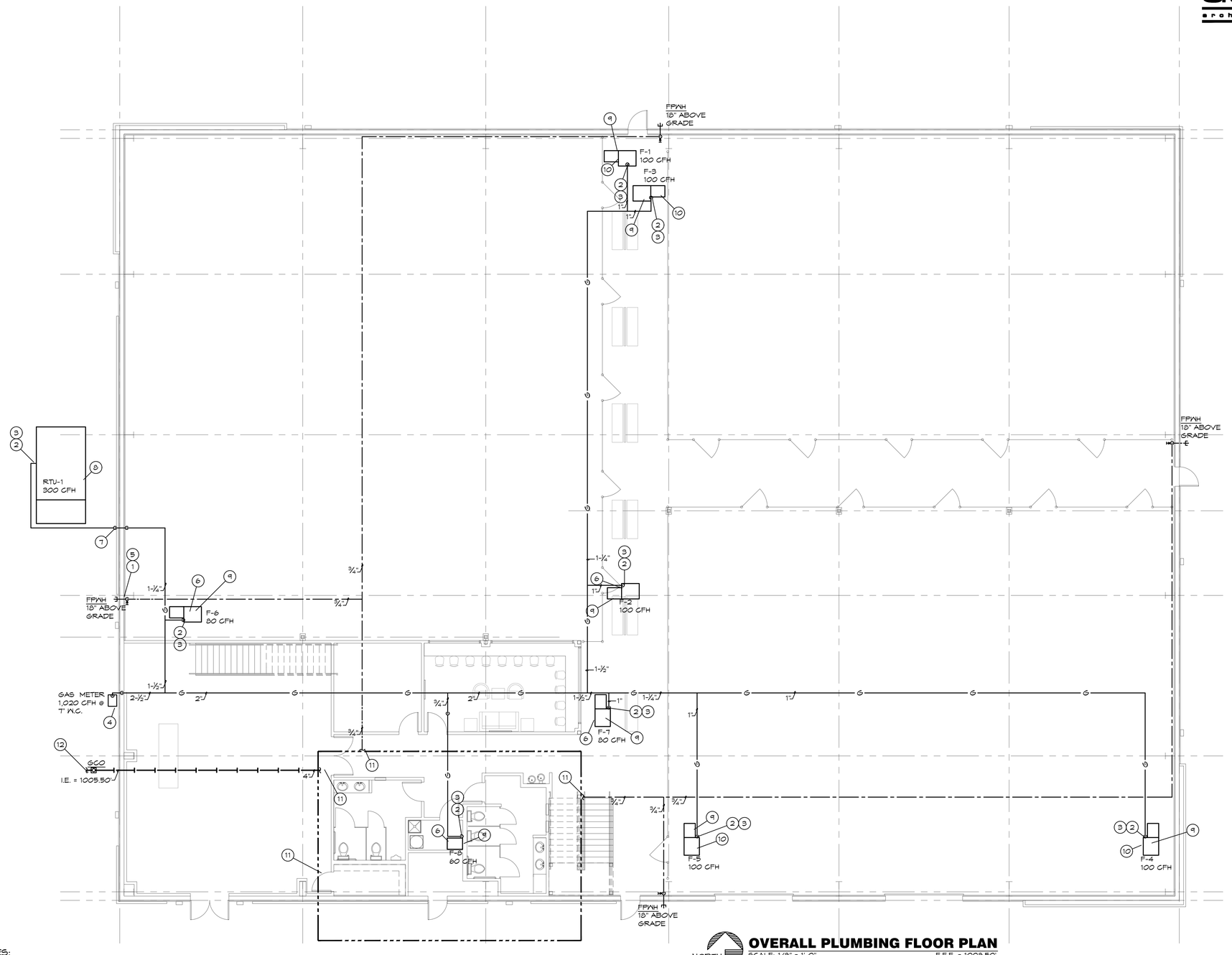
project number
20231

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 ROOFTOP UNIT LAID ROUTED TO GRASSY AREA. PROVIDE WATER TRAP AND CLEAN OUTS AS DETAILED. SECURE PVC PIPE TO DRAIN WITH NYLON STRAP.
6. PROVIDE 1" SCHEDULE 40 PVC CONDENSATE DRAIN PIPE FOR FURNACE AND FURNACE FLUE ROUTED TO GRASSY AREA. PROVIDE WATER TRAP AND CLEAN OUTS AS DETAILED. SECURE PVC PIPE TO DRAIN WITH NYLON STRAP.
7. NO PIPING SHALL BE ROUTED OVER THE TOP OF ELECTRICAL PANELS.
8. CONTRACTOR TO TEST WATER PRESSURE ON SITE AND PROVIDE PRESSURE REDUCING VALVE ON WATER SERVICE IF PRESSURE IS OVER 80 PSI.
9. ALL WATER SERVICE INSTALLATIONS INCLUDING BACKFLOW DEVICES ARE SUBJECT TO FIELD VERIFICATION AND APPROVAL BY THE WATER DEPARTMENT INSPECTOR.

PLUMBING SYMBOLS

- SOIL AND WASTE PIPING BELOW FLOOR/GRADE
- SOIL AND WASTE PIPING ABOVE FLOOR/GRADE
- V — SANITARY VENT PIPING ABOVE GRADE
- V — SANITARY VENT PIPING BELOW GRADE
- DOMESTIC COLD WATER PIPING
- DOMESTIC HOT WATER PIPING
- G — GAS PIPING
- D — EQUIPMENT DRAIN LINE
- F — 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
- GCO — GRADE CLEAN OUT
- VALVE
- BALANCING VALVE
- SOLENOID VALVE
- PRESSURE REGULATOR
- CHECK VALVE
- CONNECT TO EXISTING
- I.E. — INVERT ELEVATION OF PIPE
- MATCH MARKS ON PLUMBING RISER DIAGRAM



NORTH

OVERALL PLUMBING FLOOR PLAN
SCALE: 1/8" = 1'-0" F.F.E. = 1008.50'

PLUMBING PLAN NOTES:

1. INSTALL WALL HYDRANT 18" ABOVE GRADE / FINISHED FLOOR.
2. CONNECT GAS TO EQUIPMENT AS REQUIRED AND AS DETAILED.
3. ALL APPLIANCE CONNECTIONS SHALL BE MADE WITH UL LISTED FLEXIBLE APPLIANCE CONNECTOR. FLEX CONNECTORS SHALL BE PROVIDED BY TENANT. CONTRACTOR SHALL PROVIDE SAFETY LOCK AND CHAIN AT ALL GAS APPLIANCES ON WHEELS. PROVIDE PIPING REDUCERS AND INCREASERS AS REQUIRED TO MATE HARD PIPING WITH FLEX CONNECTORS.
4. COORDINATE WITH GAS COMPANY FOR INSTALLATION OF A METER WITH CAPACITY FOR 1,020 CFH @ 7" W.C. ROUTE PIPING UP INSIDE THE EXTERIOR WALL AND UP TO 18'-0" ABOVE FINISHED FLOOR. 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.
5. ROUTE PIPING ON INTERIOR SIDE OF INSULATION FOR FREEZE PROTECTION.
6. ROUTE ¾" DRAIN FROM FURNACE DRAIN PAN AND ¾" DRAIN FROM EVAPORATOR COILS TO MOP BASIN/FLOOR DRAIN AS REQUIRED. LEAVE AIR GAP.
7. ROUTE GAS PIPE DOWN TO 18" AFF AND PENETRATE EXTERIOR WALL. ROUTE GAS PIPE ABOVE GRADE AND OVER TO RTU AS REQUIRED.

PLUMBING PLAN NOTES:

8. CONNECT CONDENSATE TO RTU AS REQUIRED AND AS DETAILED.
9. CONNECT CONDENSATE TO FURNACE AND FURNACE FLUE AS REQUIRED AND AS DETAILED.
10. ROUTE ¾" DRAIN FROM FURNACE DRAIN PAN AND ¾" DRAIN FROM EVAPORATOR COILS TO GRADE AS REQUIRED. LEAVE AIR GAP.
11. SEE ENLARGED PLUMBING PLAN ON SHEET P1.1 FOR CONTINUATION OF PIPING AND PIPING IN THIS AREA.
12. SEE CIVIL PLAN FOR CONTINUATION OF 4" SANITARY SEWER. MAINTAIN MIN 30" COVER.

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5/19/2022

STATE OF MISSOURI — REGISTERED ENGINEER — MAXWELL T. APPLE — NUMBER PE-2010031443 — PROFESSIONAL

a new development for
Town Centre Lot 1
520 NE Town Centre Drive
Lee's Summit, Missouri 64064

date 05.19.22
drawn by MA/FS
checked by EK/DS
revisions △

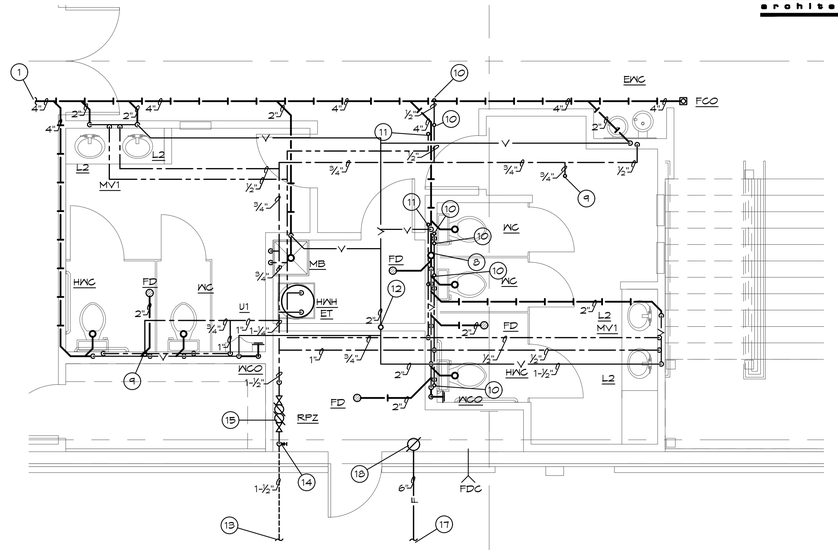
BC PROJECT #: 22323
MISSOURI PE COA #2009003629

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

sheet number
P1.0
drawing type permit
project number 20231

PLUMBING PLAN NOTES:

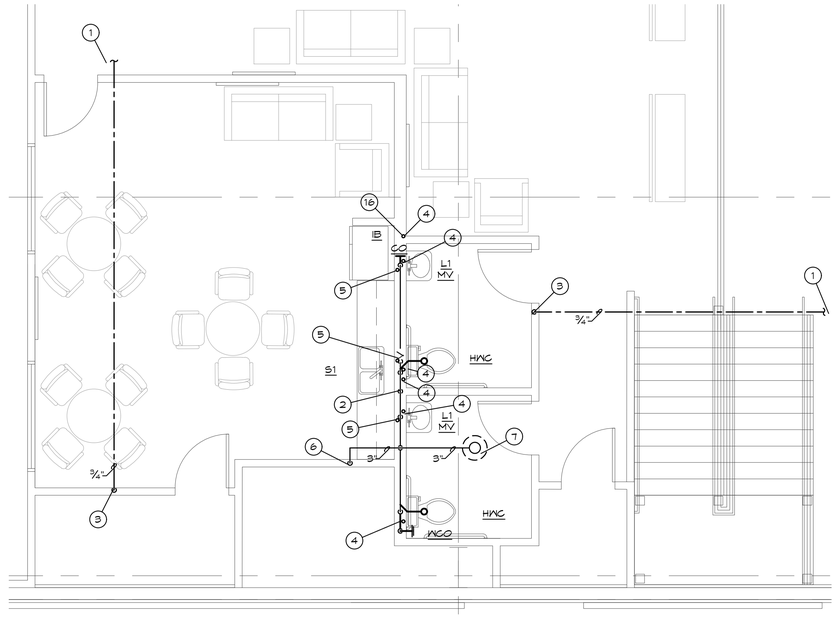
1. REFER TO SHEET P1.0 FOR CONTINUATION OF PIPING.
2. 4" WASTE PIPE DOWN TO FLOOR BELOW. REFER TO ENLARGED FIRST FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING. PROVIDE CLEANOUT AT BASE OF RISER.
3. ¾" CW UP FROM FLOOR BELOW. REFER TO ENLARGED FIRST FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING.
4. ½" CW UP FROM FLOOR BELOW. REFER TO ENLARGED FIRST FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING.
5. ½" HW UP FROM FLOOR BELOW. REFER TO ENLARGED FIRST FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING.
6. 3" VENT PIPE UP FROM FLOOR BELOW. REFER TO ENLARGED FIRST FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING.
7. LOCATION OF 3" VTR. VERIFY 10' CLEARANCE FROM ALL OUTDOOR AIR INTAKES. SEAL PENETRATION WEATHERTIGHT.
8. 4" WASTE PIPE DOWN FROM FLOOR ABOVE. REFER TO ENLARGED 2ND FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING. PROVIDE CLEANOUT AT BASE OF RISER.
9. ¾" CW UP TO FLOOR ABOVE. REFER TO ENLARGED 2ND FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING.
10. ½" CW UP TO FLOOR ABOVE. REFER TO ENLARGED 2ND FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING.
11. ½" HW UP TO FLOOR ABOVE. REFER TO ENLARGED 2ND FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING.
12. 3" VENT PIPE UP TO FLOOR ABOVE. REFER TO ENLARGED 2ND FLOOR PLUMBING PLAN FOR CONTINUATION OF PIPING.
13. SEE CIVIL PLAN FOR CONTINUATION OF 1-½" DOMESTIC C.W. MAINTAIN MIN 48" COVER.
14. ROUTE PIPING ON INTERIOR SIDE OF INSULATION FOR FREEZE PROTECTION.
15. PROVIDE 1-½" RPZ BACKFLOW PREVENTER AND INSTALL 24" A.F.F. & 6" FROM WALL. ROUTE DRAIN FROM RPZ BFP TO FLOOR DRAIN WITH AN AIR GAP.
16. PROVIDE ICE MAKER BOX WITH VALVE FOR CONNECTION TO REFRIGERATOR BY OTHERS.
17. 6" FIRE LINE, SEE CIVIL PLANS FOR CONTINUATION. MAINTAIN A MINIMUM 48" BURY FOR FREEZE PROTECTION.
18. ROUTE 6" FIRE LINE THRU FOUNDATION UP THRU FLOOR 24" AFF AND CAP FOR FUTURE EXTENSION BY SPRINKLER CONTRACTOR.



NORTH

ENLARGED PLUMBING 1ST FLOOR PLAN

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



NORTH

ENLARGED PLUMBING 2ND FLOOR PLAN

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

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5/19/2022

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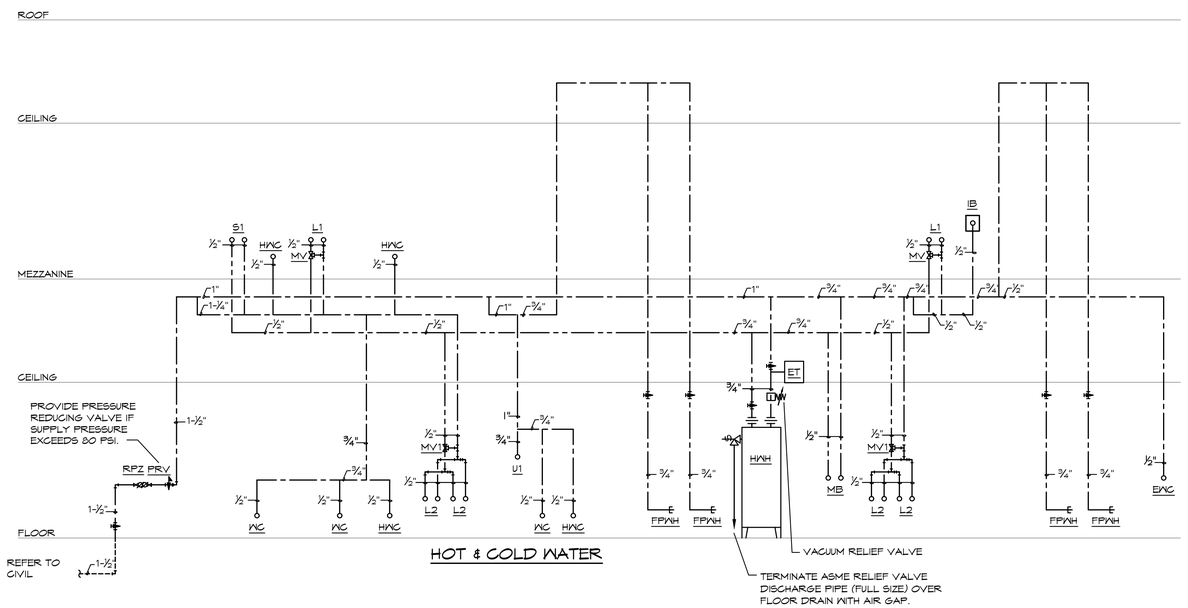
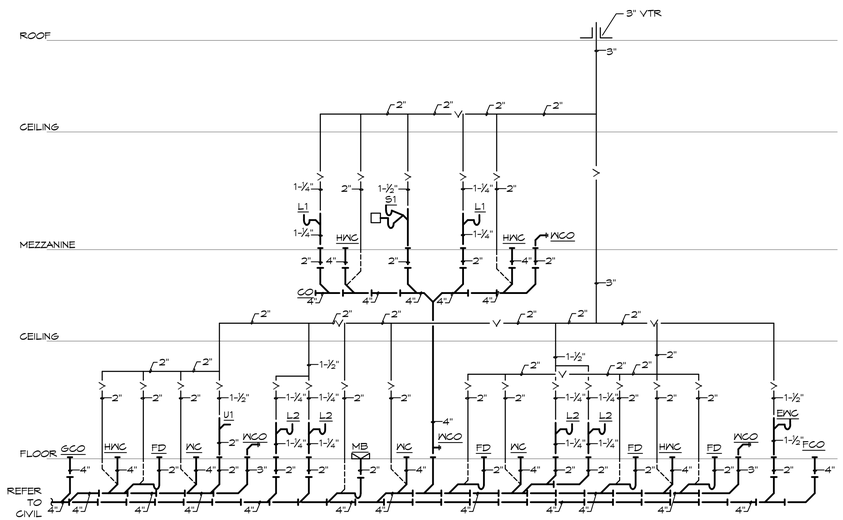


HOT & COLD WATER



WASTE & VENT

PLUMBING RISER DIAGRAMS

SCALE: NONE

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"	1/2"	1/2"
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.

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 FIXTURE SCHEDULE:

HWC — HANDICAP WATER CLOSET: TOTO, #CST744EL(R,N, "DRAKE CLOSE COUPLED TOILET", 1.28 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.

WC — WATER CLOSET: TOTO, #CST744E(R)(G,N, "DRAKE CLOSE COUPLED TOILET",1.28 GALLON FLUSH, 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.

L1 — LAVATORY, WALL HUNG: TOTO #LT307,VITREOUS CHINA, INTEGRAL BACK, 20"x 18", FRONT OVERFLOW, DELTA #501 FAUCET WITH SINGLE METAL LEVER, GRID DRAIN WITH 1-1/4" TAILPIECE, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT, CHROME PLATED ANGLE STOPS AND RISERS,CONCEALED ARM FLOOR MOUNTED LAVATORY CARRIER.

L2 — HANDICAP LAVATORY, COUNTERTOP: TOTO, #LT501, VITREOUS CHINA,20"x 17" OVAL BASIN, DELTA #501 FAUCET WITH SINGLE METAL LEVER HANDLE, OFFSET GRID DRAIN WITH 1-1/4" TAILPIECE, CHROME PLATED P-TRAP(MOUNTED PARALLEL WITH WALL), CHROME PLATED ANGLE STOPS AND RISERS,INSULATE EXPOSED DRAIN, WATER SUPPLIES, AND VALVES WITH PROWRAP SEAMLESS MOLDED CLOSED CELL VINYL INSULATION.

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.

S1 — SINK, DOUBLE COMPARTMENT: ELKAY, #LR-3322, TWO 13-1/2"x16"x8" DEEP BOWL, 32-3/8"x21-3/8" CUT-OUT, SELF-RIMMING STAINLESS STEEL SINK WITH SATIN FINISH AND SOUND DAMPENING UNDERCOATING, CHICAGO FAUCET#1100 FAUCET, SWING SPOUT, AERATOR, WING HANDLES, #LK-35 BASKET STRAINER WITH 1-1/2" TAILPIECE, 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. SINK CUT-OUT IN CASEWORK SHALL BE BY CASEWORK CONTRACTOR.

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

EAC — ELECTRIC WATER COOLER: OASIS, #PG8ACSL, BARRIER FREE TWO-STATION WATER COOLER, 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 ANTIMICROBIAL PUSH PADS, ANITMICROBIAL FLEX BUBBLERS, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT, CHROME PLATED LOOSE KEY ANGLE STOP, FLOOR MOUNTED CARRIER AND CANE APRON.

FD — FLOOR DRAIN: SIOUX CHIEF, #842, PVC FLOOR DRAIN WITH ADJUSTABLE TOP AND CAST BRASS STRAINER.

HWH — HOT WATER HEATER: AO SMITH #DEL-40, 40 GALLON STORAGE, 208 VOLT, SINGLE PHASE, (2) 4500 WATT ELEMENT, NON-SIMULTANEOUS, ASME TEMPERATURE AND PRESSURE RELIEF VALVE. SET TEMPERATURE TO 120°F.

ET — HOT WATER EXPANSION TANK: AMTROL, #ST-8, 3.2 GALLON EXPANSION TANK WITH DIAPHRAGM.

MV — MIXING VALVE: WATTS, #LFUSG-B, THERMOSTATIC CONTROLLED MIXING VALVE, LEAD FREE BRONZE BODY, LOCKED TEMPERATURE ADJUSTMENT CAP (VANDAL RESISTANT), COPPER ENCAPSULATED THERMOSTAT ASSEMBLY WITH BRASS SHUTTLE, STAINLESSSTEEL SPRINGS, INTEGRAL CHECK VALVES ON HOT AND COLD INLETS. (SET TO 110°F). ASSE 1070 LISTED.

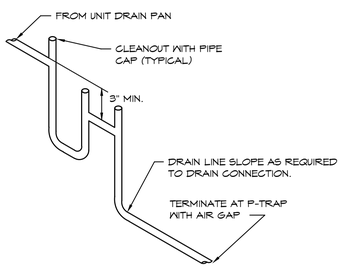
MV1 — MIXING VALVE: WATTS, #LFMMV THERMOSTATIC CONTROLLED MIXING VALVE,LEAD FREE BRONZE BODY, LOCKED TEMPERATURE ADJUSTMENT CAP (VANDAL RESISTANT), SOLID WAX HYDRAULIC PRINCIPLE THERMOSTAT,INTEGRAL FILTER WASHERS AND CHECK VALVES ON HOT AND COLD INLETS.(SET TO 110°F) ASSE #1017,#1068,#1070

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.

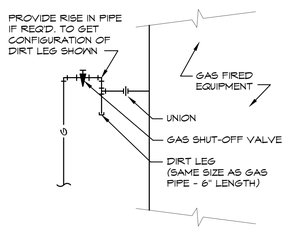
FCO/WCO — VINYL TILE FLOOR: JR SMITH #4140, OR EQUAL.
QUARRY TILE FLOOR: JR SMITH #4200, OR EQUAL.
CARPETED FLOOR: JR SMITH #4020-Y, OR EQUAL.
UNFINISHED FLOOR: JR SMITH #4022, OR EQUAL.
WALL: JR SMITH #4472, OR EQUAL, 24" ABOVE THE FLOOR.

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



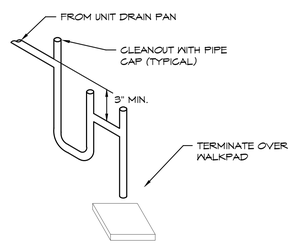
CONDENSATE DRAIN DETAIL

SCALE: NONE



GAS CONNECTION DETAIL

SCALE: NONE



CONDENSATE DRAIN DETAIL

SCALE: NONE

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5/19/2022

STATE OF MISSOURI — REGISTERED — MAXWELL T. APPLE — NUMBER PE-2010031493 — PROFESSIONAL ENGINEER

a new development for

Town Centre Lot 1

520 NE Town Centre Drive
Lee's Summit, Missouri 64064

date
05.19.22
drawn by
MA/FS
checked by
EK/DS
revisions
△

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

sheet number
P2.0
drawing type
permit
project number
20231

RELEASED FOR CONSTRUCTION
As Noted on Plans Review
Development Services Department
Lee's Summit, Missouri
5/19/2022

MECHANICAL GENERAL NOTES:

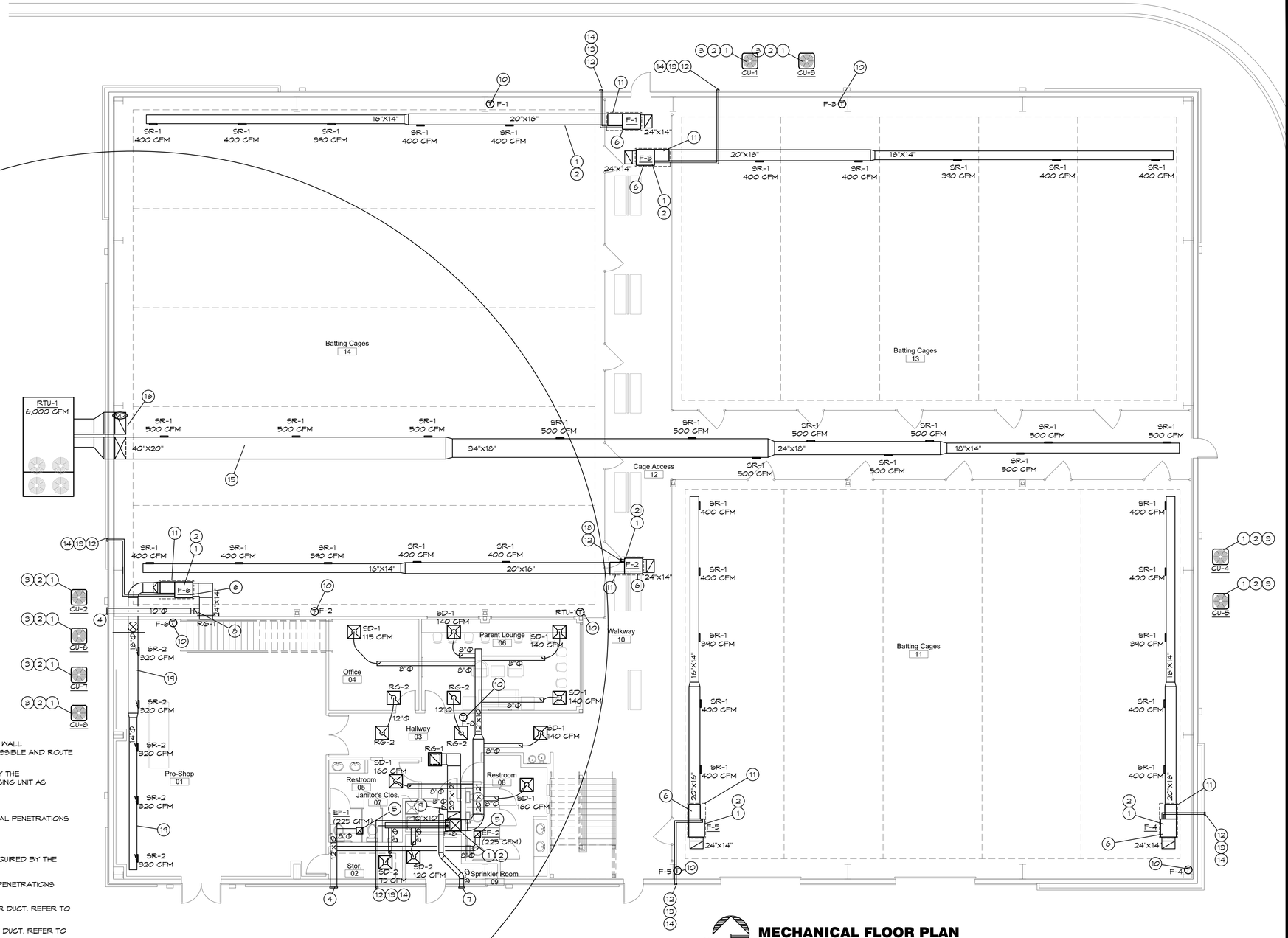
1. COORDINATE ALL WORK WITH OTHER TRADES AND EXISTING CONDITIONS AS REQUIRED TO PROPERLY INSTALL ALL SYSTEMS AS INTENDED, WITHIN THE CONFINES OF THE SPACES AVAILABLE, AND WITHOUT INTERFERENCES.
2. THIS CONTRACTOR SHALL PERFORM ALL WORK INDICATED AND/OR AS REQUIRED FOR THE PROPER INSTALLATION AND OPERATION 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 MATERIALS 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.
9. ALL MECHANICAL SYSTEMS SHALL BE BALANCED BY A CERTIFIED BALANCING CONTRACTOR. REFER TO SPECIFICATIONS FOR DETAILS.

MECHANICAL SYMBOLS

- NEW SUPPLY DIFFUSER
- NEW RETURN AIR GRILLE
- EXHAUST GRILLE/FAN
- (S) REMOTE TEMPERATURE SENSOR
- (T) THERMOSTAT, MOUNTED AT 48" AFF
- (SD) DUCT-MOUNTED SMOKE DETECTOR
- 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
- 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

MECHANICAL PLAN NOTES:

1. REFRIGERANT PIPING THROUGH EXTERIOR WALL AT 18" ABOVE GRADE. SEAL WALL PENETRATION WEATHERTIGHT. ROUTE PIPE UP INSIDE WALL TO AS HIGH AS POSSIBLE AND ROUTE TO UNITS.
2. CONNECT REFRIGERANT PIPING TO CONDENSING UNIT & COIL AS REQUIRED BY THE MANUFACTURER. PROVIDE AND INSTALL REFRIGERANT PIPING FOR CONDENSING UNIT AS REQUIRED BY MANUFACTURER.
3. PROVIDE PREFABRICATED OR CONCRETE PAD FOR CONDENSING UNITS.
4. PROVIDE WALL VENT CAP WITH BACKDRAFT DAMPER FOR EXHAUST FAN. SEAL PENETRATIONS WEATHERTIGHT.
5. SUPPORT FAN FROM STRUCTURE AS REQUIRED BY THE MANUFACTURER.
6. SUPPORT UNIT FROM STRUCTURE AND PROVIDE VIBRATION ISOLATION AS REQUIRED BY THE MANUFACTURER. PROVIDE ADDITIONAL SUPPORT STEEL AS REQUIRED.
7. PROVIDE WALL VENT CAP FOR OUTDOOR INTAKE WITH BIRD SCREEN. SEAL PENETRATIONS WEATHERTIGHT.
8. CONNECT 10"Φ OUTDOOR AIR DUCT WITH BALANCING DAMPER TO RETURN AIR DUCT. REFER TO OUTDOOR AIR CALCULATIONS FOR MINIMUM OUTDOOR AIR VOLUME.
9. CONNECT 8"Φ OUTDOOR AIR DUCT WITH BALANCING DAMPER TO RETURN AIR DUCT. REFER TO OUTDOOR AIR CALCULATIONS FOR MINIMUM OUTDOOR AIR VOLUME.
10. PROVIDE 7-DAY PROGRAMMABLE AUTO/HEAT/COOL THERMOSTAT AT 48" AFF.
11. PROVIDE WATERPROOF GALVANIZED SHEET METAL DRAIN PAN UNDER FURNACE & EVAPORATOR COIL. REFER TO PLUMBING PLANS FOR CONDENSATE AND DRAIN PAN PIPING.
12. COORDINATE WITH G.C. & METAL BUILDING MANUFACTURER TO SEAL FLUE PENETRATIONS WEATHER TIGHT.
13. 3"Φ CPVC FLUE & COMBUSTION AIR INTAKE UP THROUGH WALL TO MANUFACTURER'S VENT TERMINATION AS REQUIRED. OFFSET AS REQUIRED TO MAINTAIN 10' CLEARANCE FROM ALL OUTDOOR AIR INTAKES. SEAL PENTRATIONS WEATHER TIGHT.
14. MAINTAIN 10' CLEARANCE FROM ALL OUTDOOR AIR INTAKES.
15. ROUTE DUCTWORK UP TO AS HIGH AS POSSIBLE.
16. INSTALL BIRDSCREEN OVER R.A. OPENING AS REQUIRED.
17. TURN R.A. DUCT UP 18" AND INSTALL BIRD SCREEN ON OPEN DUCT AS REQUIRED.
18. 3"Φ CPVC FLUE & COMBUSTION AIR INTAKE UP THROUGH ROOF TO MANUFACTURER'S VENT TERMINATION AS REQUIRED. OFFSET AS REQUIRED TO MAINTAIN 10' CLEARANCE FROM ALL OUTDOOR AIR INTAKES. SEAL PENTRATIONS WEATHER TIGHT.
19. INSTALL BOTTOM OF DUCT AT 12'-6" AFF.



NORTH

MECHANICAL FLOOR PLAN
SCALE: 1/8" = 1'-0"

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5/19/2022

STATE OF MISSOURI
REGISTERED
MAXWELL T. APPLE
NUMBER
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a new development for
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520 NE Town Centre Drive
Lee's Summit, Missouri 64064

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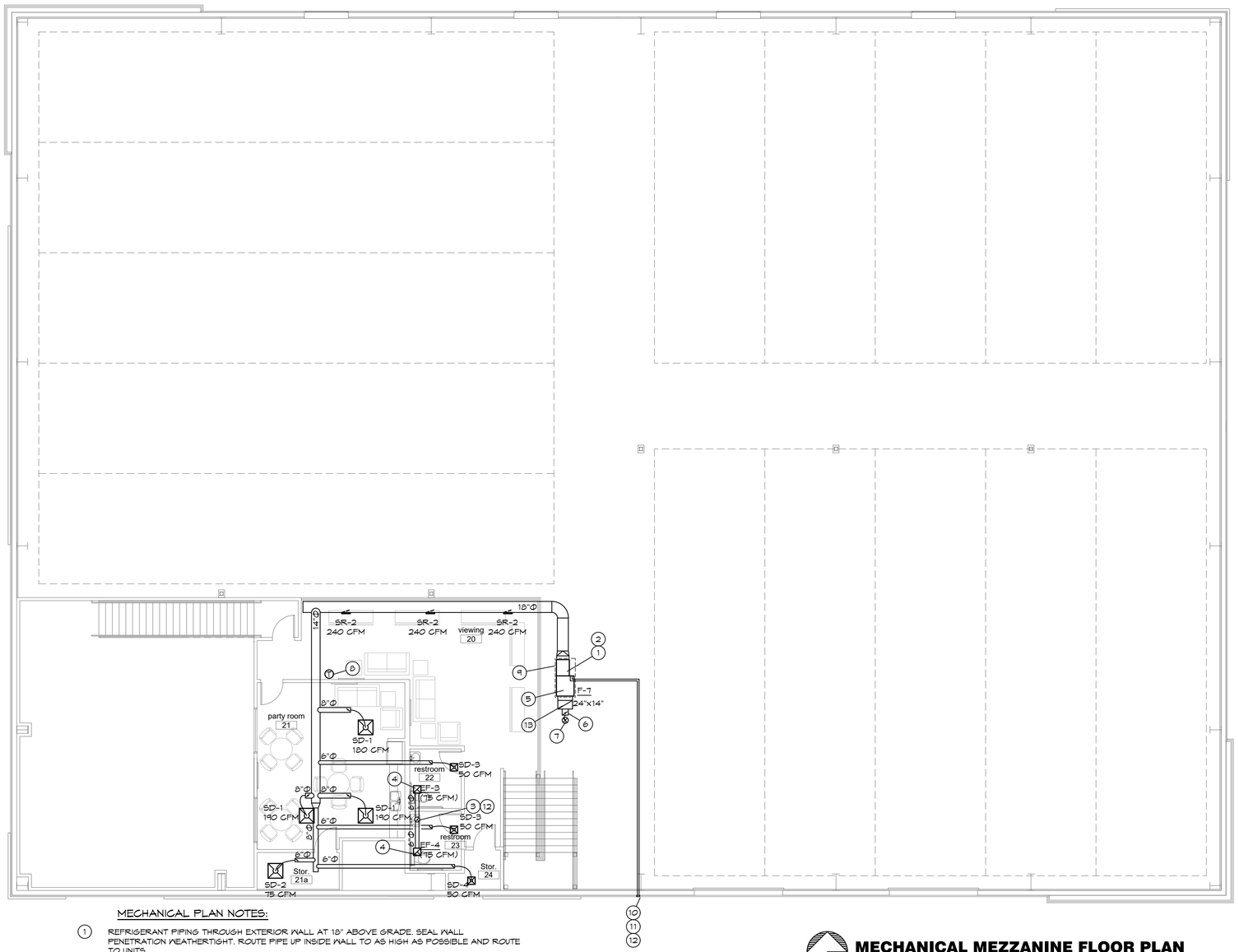

MECHANICAL PLAN NOTES:

1. REFRIGERANT PIPING THROUGH EXTERIOR WALL AT 18" ABOVE GRADE. SEAL WALL PENETRATION WEATHERTIGHT. ROUTE PIPE UP INSIDE WALL TO AS HIGH AS POSSIBLE AND ROUTE TO UNITS.
2. CONNECT REFRIGERANT PIPING TO CONDENSING UNIT & COIL AS REQUIRED BY THE MANUFACTURER. PROVIDE AND INSTALL REFRIGERANT PIPING FOR CONDENSING UNIT AS REQUIRED BY MANUFACTURER.
3. ROUTE 8"Ø EXHAUST DUCT UP THRU ROOF TO WEATHERHEAD AS REQUIRED. SEAL PENETRATION WEATHERTIGHT.
4. SUPPORT FAN FROM STRUCTURE AS REQUIRED BY THE MANUFACTURER.
5. SUPPORT UNIT FROM STRUCTURE AND PROVIDE VIBRATION ISOLATION AS REQUIRED BY THE MANUFACTURER. PROVIDE ADDITIONAL SUPPORT STEEL AS REQUIRED.
7. PROVIDE WALL VENT CAP FOR OUTDOOR INTAKE WITH BIRD SCREEN. SEAL PENETRATIONS WEATHERTIGHT.
6. CONNECT 10"Ø OUTDOOR AIR DUCT WITH BALANCING DAMPER TO RETURN AIR DUCT. REFER TO OUTDOOR AIR CALCULATIONS FOR MINIMUM OUTDOOR AIR VOLUME.
7. ROUTE 10"Ø OUTDOOR AIR DUCT UP THRU ROOF TO WEATHERHEAD AS REQUIRED. SEAL PENETRATION WEATHERTIGHT.
8. PROVIDE 7-DAY PROGRAMMABLE AUTO/HEAT/COOL THERMOSTAT AT 48" AFF.
9. PROVIDE WATERPROOF GALVANIZED SHEET METAL DRAIN PAN UNDER FURNACE & EVAPORATOR COIL. REFER TO PLUMBING PLANS FOR CONDENSATE AND DRAIN PAN PIPING.
10. COORDINATE WITH G.C. & METAL BUILDING MANUFACTURER TO SEAL FLUE PENETRATIONS WEATHER TIGHT.
11. 3"Ø CPVC FLUE & COMBUSTION AIR INTAKE UP THROUGH WALL TO MANUFACTURER'S VENT TERMINATION AS REQUIRED. OFFSET AS REQUIRED TO MAINTAIN 10' CLEARANCE FROM ALL OUTDOOR AIR INTAKES. SEAL PENTRATIONS WEATHER TIGHT.
12. MAINTAIN 10' CLEARANCE FROM ALL OUTDOOR AIR INTAKES.
13. TURN R.A. DUCT UP 18" AND INSTALL BIRD SCREEN ON OPEN DUCT AS REQUIRED.

NORTH

MECHANICAL MEZZANINE FLOOR PLAN

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

BC PROJECT #: 22323
MISSOURI PE COA #2009003629

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

a new development for
Town Centre Lot 1
520 NE Town Centre Drive
Lee's Summit, Missouri 64064

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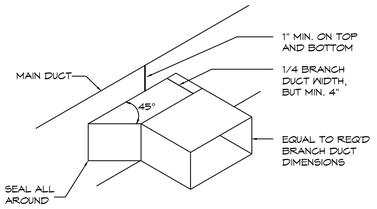
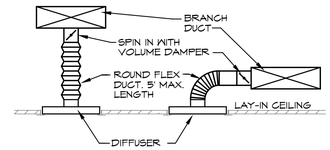
EXHAUST FAN SCHEDULE

MARK	MFGR	MODEL	CFM	EXTERNAL STATIC P. IN. WG.	RPM	ELECTRICAL		FAN TYPE	CONTROLS	NOTES
						VOLT/Ø/HZ	PWR			
EF-1	COOK	GC-182	225	0.25	1,400	120/1/60	167 W	CEILING EXH.	SWITCH	1
EF-2	"	"	"	"	"	"	"	"	"	"
EF-3	"	GC-128	75	0.1	750	"	29 W	"	"	"
EF-4	"	"	"	"	"	"	"	"	"	"

NOTES: 1. PROVIDE CEILING GRILLE, INTEGRAL BACK DRAFT DAMPER, VARI-SPEED CONTROLLER (NEAR FAN AND ABOVE CEILING), AND WEATHER HEAD.

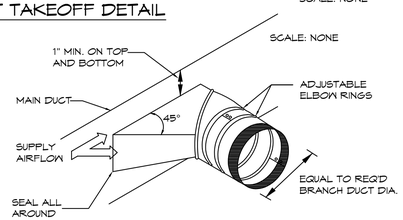


BRANCH DUCT TAKEOFF DETAIL



DIFFUSER DETAIL

SCALE: NONE



BRANCH DUCT TAKEOFF DETAIL

SCALE: NONE

FURNACE SCHEDULE

MARK	MFGR	MODEL NO.	CFM	EXT. STATIC P. IN. WG.	HEATING (GAS)		ELECTRICAL		OUTSIDE AIR (CFM)	NOTES
					BTUH INPUT	BTUH OUTPUT	VOLT/Ø/HZ	HP		
F-1	YORK	TM9E100C20MP12	1,990	0.6	100,000	95,000	115/1/60	1	0	1,2,3,4,5
F-2	"	"	"	"	"	"	"	"	0	"
F-3	"	"	"	"	"	"	"	"	0	"
F-4	"	"	"	"	"	"	"	"	0	"
F-5	"	"	"	"	"	"	"	"	0	"
F-6	"	TM9E080C16MP12	1,600	0.5	80,000	76,000	"	5/8	360	1,2,3,4,5,6
F-7	"	"	"	"	"	"	"	"	400	"
F-8	"	TM9E060B12MP12	1,200	0.7	60,000	57,000	"	1/2	175	1,2,3,4,5,7

NOTES:
1. PROVIDE 1" THICK THROWAWAY TYPE FILTER WITH HOLDING FRAME FOR EACH UNIT.
2. PROVIDE EACH UNIT WITH 7-DAY PROGRAMMABLE HEAT/COOL/AUTO CHANGEOVER THERMOSTAT WITH OPTIMUM START CONTROLS.
3. CONDENSING UNITS, COOLING COILS, AND FURNACES SHALL ALL BE OF THE SAME MANUFACTURER.
4. 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 AND COILS.
5. PROVIDE GALVANIZED WATERTIGHT DRAIN PAN AND CONDENSATE FLOAT SWITCH TO DE-ENERGIZE THE FURNACE IF THE DRAIN PAN FILLS WITH WATER.
6. PROVIDE UNIT WITH 10"Ø ROUND CONTROL DAMPER FOR CONTROL OF OUTDOOR AIR SUPPLY. INTERLOCK WITH FURNACE CONTROLS SO THAT DAMPER IS OPEN WHEN FURNACE FAN IS ON, AND IS CLOSED WHEN FURNACE SUPPLY FAN IS NOT IN OPERATION.
6. PROVIDE UNIT WITH 8"Ø ROUND CONTROL DAMPER FOR CONTROL OF OUTDOOR AIR SUPPLY. INTERLOCK WITH FURNACE CONTROLS SO THAT DAMPER IS OPEN WHEN FURNACE FAN IS ON, AND IS CLOSED WHEN FURNACE SUPPLY FAN IS NOT IN OPERATION.

CONDENSING UNIT SCHEDULE

MARK	MFGR	MODEL NO.	COOLING			ELECTRICAL			EVAP. COIL MODEL NO.	SEER	NOTES
			TOTAL BTUH	AMB.	EVAP. EAT DB/WB	VOLT/Ø/HZ	MIN. MCA (AMPS)	MIN. MOCP (AMPS)			
CU-1	YORK	TCD60B31S	56,000	95	80/67	208/3/60	21.2	35	CM60C	13.8	1,2,3,4
CU-2	"	"	"	"	"	"	"	"	"	"	"
CU-3	"	"	"	"	"	"	"	"	"	"	"
CU-4	"	"	"	"	"	"	"	"	"	"	"
CU-5	"	"	"	"	"	"	"	"	"	"	"
CU-6	"	TCD48B31S	47,500	"	"	"	18.4	30	CM48C	14	"
CU-7	"	"	"	"	"	"	"	"	"	"	"
CU-8	"	TC536B31S	34,600	"	"	"	12.1	20	CM36B	"	"

NOTES:
1. PROVIDE TIME DELAY ON COMPRESSOR RE-START, CRANKCASE HEATER, AND COMPRESSOR LOCK-OUT WITH AMBIENT BELOW 35 °F. PROVIDE INDOOR COIL WITH THERMAL EXPANSION VALVE (TXV).
2. MECHANICAL CONTRACTOR SHALL COORDINATE ALL UNIT MOCP'S OF ACTUAL INSTALLED EQUIPMENT WITH ELECTRICAL CONTRACTOR.
3. PROVIDE CONCRETE OR PRE-MAUFACTURED POLYOLEFIN PAD FOR EACH UNIT.
4. PROVIDE HAIL GUARDS FOR EACH UNIT.

ROOFTOP UNIT SCHEDULE

MARK	MFGR.	MODEL NO.	NOM. TONS	EVAP. CFM	EXT. STATIC P. IN. WG. (NOTE 2)	COOLING				HOT GAS REHEAT	HEATING (GAS)			ELECTRICAL					UNIT CONTROLS	BLOWER DRIVE TYPE	ECONOMIZER + BAROMETRIC RELIEF		MINIMUM OUTDOOR AIR (CFM) *	SEER /EER	TOTAL WEIGHT (LBS)	NOTES
						COOLING STAGES	TOTAL BTUH	SENS. BTUH	AMB.	EVAP. EAT DB/WB		BTUH INPUT	BTUH OUTPUT	HEATING STAGES	VOLT/Ø/HZ	BLOWER MOTOR	POWER EXHAUST	MCA (AMPS)	MOCP (AMPS)			TYPE	CONTROLLER				
RTU-1	YORK	ZF180N30D2	15	6,000	1.25	2	177,100	133,400	105	80/67	N	300,000	240,000	2	208/3/60	5 HP	N	78	100	DIGITAL	CAV	NONE	NONE	900	- / 10.8	850	1,2,3,4,5,6

NOTES:
1. PROVIDE 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. 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.
3. PROVIDE COMMERCIAL 7-DAY PROGRAMMABLE HEAT/COOL/AUTO CHANGEOVER TOUCHSCREEN THERMOSTAT WITH OPTIMUM START CONTROLS. OUTDOOR AIR DAMPER IS TO CLOSE DURING UNOCCUPIED HOURS.
4. PROVIDE 18" HIGH PRE-FABRICATED INSULATED ROOF CURB.
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.

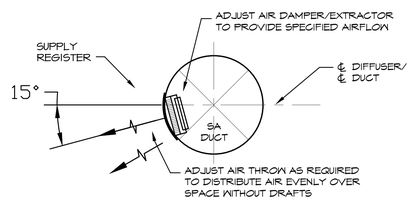
* OCCUPANCY FOR BATTING CAGES IS 30 PEOPLE. 30*30 = 900 CFM MINIMUM REQUIRED FOR BATTING CAGE AREA.

DIFFUSER SCHEDULE

MARK	MFGR	MODEL	BORDER TYPE	NECK SIZE	FACE SIZE	FINISH	DAMPER	ACCESSORIES	NOTES
SD-1	TITUS	TMS	3	8"Ø	24"x24"	WHITE	-	-	-
SD-2	"	"	"	"	"	"	OB DAMPER	TRM KIT	-
SD-3	"	"	"	6"Ø	12"x12"	"	-	-	-
SD-4	"	"	"	"	"	"	OB DAMPER	TRM KIT	-
RG-1	"	PAR	"	18"x18"	24"x24"	"	-	-	-
RG-2	"	"	"	12"Ø	24"x24"	"	-	-	
SR-1	"	300FS	"	12"x10"	-	"	OB DAMPER	-	
SR-2	"	S300FS	"	20"x4"	-	ANODIZED	VOLUME DAMPER	-	

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 (Vbz)	Zone air distribution effectiveness (Ez)	Zone outdoor airflow (cfm)
F-6	1230	Sales	15	7.5	0.12		286	0.8	357
								Total	357
F-7	1015	Conference rooms	50	5	0.06		315	0.8	393
								Total	393
F-8	336	Conference/meeting	50	5	0.06		104	0.8	130
	188	Office spaces	5	5	0.06		16	0.8	20
	320	Corridors	0	0	0.06		19	0.8	24
								Total	174



SUPPLY REGISTER DETAIL

SCALE: NONE

BC ENGINEERS INCORPORATED
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4301 Indian Creek Parkway
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5/19/2022

STATE OF MISSOURI — MAXWELL T. APPLE — NUMBER PE-2010031493 — REGISTERED PROFESSIONAL ENGINEER

a new development for
Town Centre Lot 1
520 NE Town Centre Drive
Lee's Summit, Missouri 64064

date 05.19.22
drawn by MA/FS
checked by EK/DS
revisions △

sheet number
M2.0
drawing type permit
project number 20231

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 ELECTRIAL 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 THAN (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 AND/OR PANEL FEEDERS 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 CONNECTIONS OR LUGS WHICH ARE DUAL RATED (ALTCU OR ALACU) 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 (#3 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 #GFTR20-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. VERIFY DEVICES AND DEVICE COVERPLATES COLOR AND STYLE WITH ARCHITECT.
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.

ELECTRICAL SPECIFICATIONS (CONTINUED)

10. PANELBOARDS:
    A. FURNISH AND INSTALL CIRCUIT BREAKER PANELBOARDS AS SHOWN ON THE DRAWINGS. PANELBOARDS SHALL BE LISTED BY UL AND SO 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 FREE LATCHING 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.
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. REMODELING WORK:
    A. DEMOLITION: DISCONNECT, DEMOLISH AND REMOVE ABANDONED ELECTRICAL MATERIALS AND EQUIPMENT INDICATED TO BE REMOVED AND NOT INDICATED TO BE SALVAGED OR REMAIN.
    B. EQUIPMENT TO BE SALVAGED:
       1) DISCONNECT AND REMOVE EXISTING ELECTRICAL EQUIPMENT INDICATED TO BE REMOVED AND SALVAGED. DELIVER EQUIPMENT TO THE LOCATION DESIGNATED BY THE OWNER FOR STORAGE.
       2) ALL MATERIALS AND EQUIPMENT DESIGNATED TO BE REUSED OR RELOCATED SHALL BE CAREFULLY REMOVED, AND STORED UNTIL NEEDED FOR REMODELING WORK. ALL ITEMS SHALL BE RESTORED TO "LIKE NEW" CONDITION WITH RUST OR CORROSION REMOVED, SURFACE PAINT TOUCHED UP OR REPAINTED AS REQUIRED TO MATCH NEW CONSTRUCTION, AND THOROUGHLY CLEANED AND INSPECTED. ANY ITEMS WHICH BECOME DAMAGED BEYOND REPAIR AS A RESULT OF CONSTRUCTION OR DEMOLITION ACTIVITY SHALL BE REPLACED WITH NEW MATERIAL EQUIVALENT IN EVERY RESPECT.
    C. DISPOSAL AND CLEANUP: REMOVE FROM THE SITE AND LEGALLY DISPOSE OF DEMOLISHED MATERIALS AND EQUIPMENT NOT INDICATED TO BE SALVAGED.
    D. PROTECT ADJACENT MATERIALS INDICATED TO REMAIN. INSTALL AND MAINTAIN DUST AND NOISE BARRIERS TO KEEP DIRT, DUST, AND NOISE FROM BEING TRANSMITTED TO ADJACENT AREAS. REMOVE PROTECTION AND BARRIERS AFTER REMODELING OPERATIONS ARE COMPLETE.
    E. PROVIDE ALL ALTERATIONS AND REWORK INDICATED AND/OR REQUIRED FOR THE PROPER INSTALLATION AND OPERATION OF ALL EXISTING ELECTRICAL SYSTEMS, INTEGRATING THE NEW AND EXISTING AREAS. LOCATE, IDENTIFY, AND PROTECT ELECTRICAL SERVICES PASSING THROUGH REMODELING AREA AND SERVING OTHER AREAS OUTSIDE THE REMODELING LIMITS. MAINTAIN SERVICES TO AREAS OUTSIDE REMODELING LIMITS. WHEN SERVICES MUST BE INTERRUPTED, INSTALL TEMPORARY SERVICES FOR AFFECTED AREAS.
       1) ABANDONED CONDUIT SHALL HAVE WIRE REMOVED AND SHALL BE CAPPED. ABANDONED OUTLETS IN WALLS OR PARTITIONS SHALL HAVE DEVICES AND WIRE REMOVED, AND SHALL BE COVERED.
       2) WHERE EXISTING CONDUITS TERMINATE AT AN EXISTING OUTLET IN A WALL, CEILING, OR FLOOR TO BE REMOVED, DISCONNECT AND REMOVE DEVICE AND WIRE FROM CONDUIT. CONDUIT SHALL BE CUT BACK AND CAPPED (BELOW THE FLOOR OR ABOVE THE CEILING) SO NOT TO CREATE AN OBSTRUCTION. PATCH FLOOR TO MATCH EXISTING.
       3) WHERE EXISTING CIRCUITS EXTEND BEYOND THE OUTLET IN THE EXISTING WALL, CEILING, OR FLOOR TO BE REMOVED, FURNISH AND INSTALL NEW CONDUIT AND WIRE TO EITHER REROUTE THE CIRCUIT OR FEED THE REMAINING OUTLET(S) FROM ANOTHER ELECTRICAL SOURCE, BUT IN SUCH A MANNER AS NOT TO REVISE THE CIRCUIT. ALL REROUTED CONDUIT SHALL BE APPROVED BY THE ARCHITECT.
       4) WHERE EXISTING OUTLETS IN A WALL, CEILING, OR FLOOR TO BE REMOVED ARE ESSENTIAL TO MAINTAIN OPERATION OF OTHER REMAINING OUTLETS, RELOCATE THE OUTLET TO A NEW CONVENIENT LOCATION. EXISTING WIRING DEVICES SHALL NOT BE REUSED, UNLESS OTHERWISE INDICATED.
       5) WHERE LIGHTING FIXTURES ARE INDICATED TO BE DEMOLISHED, REMOVE ALL WIRE AND MODIFY THE EXISTING CONDUIT (IF APPLICABLE) FOR THE NEW LIGHTING. ALL UNUSED CONDUIT SHALL BE REMOVED.
       6) WHERE A TELEPHONE CIRCUIT EXTENDS BEYOND AN OUTLET IN AN EXISTING WALL, CEILING, OR FLOOR TO BE REMOVED, PROVIDE NECESSARY EMPTY CONDUIT AND NOTIFY THE OWNER WHO WILL REQUEST THE OWNER TO ARRANGE WITH THE TELEPHONE COMPANY FOR NEW WIRING TO OUTLETS THAT REMAIN.
       7) WHERE EXISTING CONDUIT AND WIRE RUNS ARE LOCATED IN OR ATTACHED TO AN EXISTING WALL, CEILING OR FLOOR TO BE REMOVED, THEY SHALL BE REROUTED IN EITHER NEW OR EXISTING CONSTRUCTION TO MAINTAIN CONTINUITY OF CIRCUITS UNLESS OTHERWISE INDICATED.
       8) CONDUIT SHALL BE CONCEALED WITHIN THE EXISTING BUILDING CONSTRUCTION WHEREVER POSSIBLE, EXCEPT WHERE OTHERWISE INDICATED.
       9) EXISTING WIRE SHALL BE DISCONNECTED AND REMOVED WHEREVER EXISTING CIRCUITS ARE ABANDONED.
17. 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.
18. FIRE ALARM SYSTEM:
    A. ELECTRICAL CONTRACTOR SHALL PROVIDE DESIGN BUILD ENERGINEERED SHOP DRAWINGS OF FIRE ALARM SYSTEM TO BE INSTALLED. PROVIDE DEVICES, CONDUIT, WIRES, CABLE, PROGRAMING 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 PROGESS. CONTRACTOR IS RESPONSIBLE FOR INCLUDING IN BID/DESIGN ALL NECESSARY DEVICES (ANNUNCIATOR(S), NOTIFICATION APPLIANCES, INITIATING DEVICES, AND ADDITIONAL COMPONENTS).

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
EM	EMERGENCY BATTERY BACKUP
TR	TAMPER RESISTANT OUTLET
USB	COOPER #TRT156-X OR EQUAL DUPLEX RECEPTACLE WITH DUAL USB CHARGING PORTS. PROVIDE 2-1/8" DEEP BACK BOX.
(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 NL	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
	TVSS SURGE SUPPRESSION RECEPTACLE
	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
M	MOTOR WITH DESIGNATION
	FLOOR BOX
CONTROLS	
S	SINGLE POLE WALL SWITCH, TOP OF BOX AT 48" AFF
S_3	THREE-WAY WALL SWITCH, TOP OF BOX AT 48" AFF
S_D	DIMMER SWITCH, TOP OF BOX AT 48" AFF
S_M	MANUAL MOTOR STARTER WITH OVERLOADS

OCCUPANCY SENSORS
1. DUAL TECHNOLOGY/ULTRASONIC CEILING SENSORS SHALL BE MOUNTED 6' FROM SUPPLY/EXHAUST AIR DIFFUSERS.
2. LOW VOLTAGE CEILING SENSORS SHALL BE PROVIDED WITH 6' SLACK CONDUCTOR COILED AT SENSOR.

S_O	WALL MOUNTED DUAL-TECHNOLOGY OCCUPANCY SENSOR, WATT STOPPER #DW-100, TOP OF BOX AT 48" AFF
OS	DUAL TECHNOLOGY CEILING MOUNT OCCUPANCY SENSORS, WATTSTOPPER DT-300
PP	OCCUPANCY SENSOR POWER PACK, WATTSTOPPER BZ-150 OR EQUAL, PROVIDE LOW VOLTAGE WIRING TO OCCUPANCY SENSORS AND MOMENTARY SWITCHES
S_{MO}	MOMENTARY SWITCH, TOP OF BOX AT 48" AFF
COMMUNICATIONS	
	DATA/TELEPHONE OUTLET WITH MINIMUM ¾" CONDUIT STUBBED UP TO ABOVE ACCESSIBLE CEILING, BOTTOM OF BOX AT 16", UNLESS NOTED OTHERWISE. PROVIDE WITH PULL STRING
TV	FLAT SCREEN TELEVISION - PROVIDE AND INSTALL ONE (1) HUBBELL #RR1510X RECESSED TAMPER-RESISTANT DUPLEX RECEPTACLE WITH COVERPLATE AND ONE(1) HUBBELL #HBL260 TWO GANG LARGE CAPACITY WALL BOX (UP TO 2" KNOCKOUT) W/ MUD RING AND COVERPLATE FOR DATA. PROVIDE 2"G WITH PULL STRING TO ABOVE ACCESSIBLE CEILING FOR DATA CABLES. MOUNT BOX AT 7'-6" AFF UNLESS NOTED OTHERWISE (VERIFY)

ELECTRICAL SYMBOLS LIST

FIRE ALARM	
SD	CEILING MOUNT SMOKE DETECTOR
DD	DUCT MOUNT SMOKE DETECTOR
F	FIRE ALARM PULL STATION, TOP OF BOX AT 48" AFF
	FIRE ALARM HORN/STROBE COMBINATION SIGNAL, CENTERLINE AT 6'-8" AFF
	FIRE ALARM HORN/STROBE COMBINATION SIGNAL, PENDANT MOUNTED
	FIRE ALARM VISUAL STROBE, CENTERLINE AT 6'-8" AFF
WF	WATER FLOW SWITCH
TS	TAMPER SWITCH

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. WHERE CONDUIT IS SHOWN UNDER FLOOR, VERIFY IF FLOOR IS STRUCTURAL SLAB OR SLAB ON GRADE. IF STRUCTURAL SLAB, CORE DRILL PENETRATION, AND ROUTE CONDUIT IN SPACE BELOW. IF SLAB ON GRADE, SAW CUT EXISTING FLOOR SLAB AS REQUIRED FOR INSTALLATION OF UNDER FLOOR CONDUIT. NO STRUCTURAL ELEMENTS SHALL BE CORE DRILLED OR SAW CUT. WHEN SAW CUTTING, PATCH FLOOR TO MATCH EXISTING SURFACE AS REQUIRED.
3. IT IS THE ELECTRICAL CONTRACTORS RESPONSIBILITY TO PROPERLY BALANCE ALL BRANCH CIRCUITS BETWEEN THE PHASES OF THE SYSTEM REGARDLESS OF CIRCUITING INDICATED.
4. ALL EXPOSED RACEWAYS SHALL BE EMT CONDUIT, MC CABLE IS NOT PERMITTED IN EXPOSED AREAS.
5. 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.
6. 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.
7. EACH BRANCH CIRCUIT SHALL HAVE A DEDICATED NEUTRAL PER NEC 210.4.
8. 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.
9. 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.
10. PROVIDE LOW VOLTAGE WIRING BETWEEN ALL 0-10V DIMMING DRIVERS CONTROLLED BY 0-10V DIMMERS PER MANUFACTURER'S INSTRUCTIONS WHETHER INDICATED ON PLANS OR NOT.

BC PROJECT #: 22323
MISSOURI PE COA #2009003629

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5/19/2022

a new development for
Town Centre Lot 1
520 NE Town Centre Drive
Lee's Summit, Missouri 64064

date 05.19.22
drawn by MA/FS
checked by EK/DS
revisions △

sheet number E0
SPECIFICATIONS AND LEGEND
drawing type permit
project number 20231

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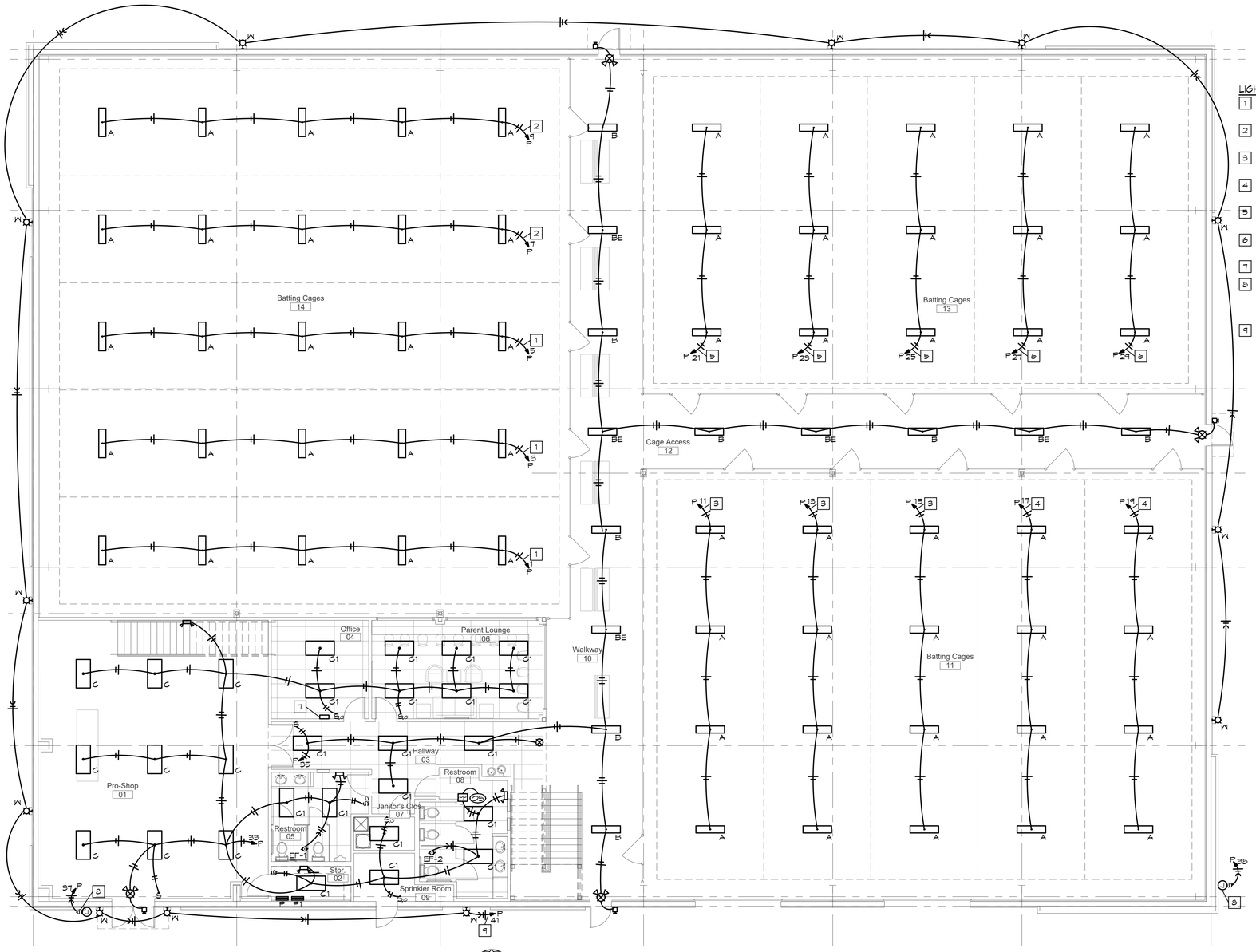
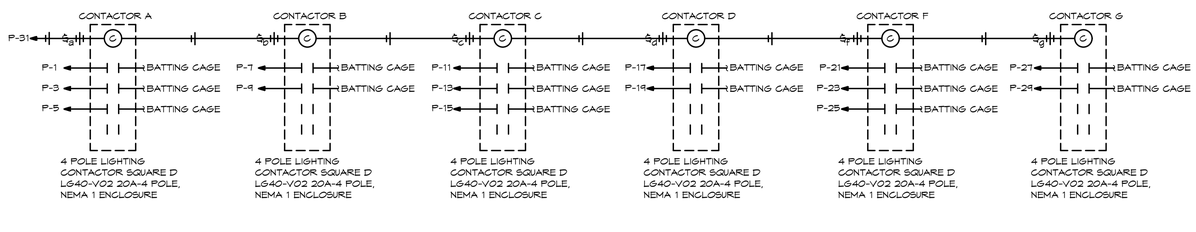


NORTH

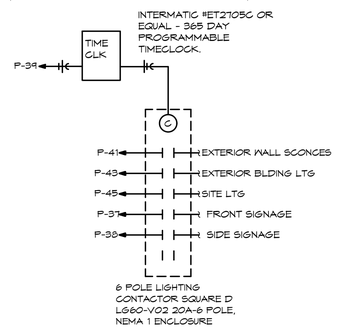
ELECTRICAL LIGHTING PLAN
SCALE: 1/8" = 1'-0"

LIGHTING PLAN NOTES:

1. ROUTE CIRCUIT THROUGH CONTACTOR A FOR CONTROL OF BATTING CAGE LIGHTS. SEE DETAIL, THIS SHEET.
2. ROUTE CIRCUIT THROUGH CONTACTOR B FOR CONTROL OF BATTING CAGE LIGHTS. SEE DETAIL, THIS SHEET.
3. ROUTE CIRCUIT THROUGH CONTACTOR C FOR CONTROL OF BATTING CAGE LIGHTS. SEE DETAIL, THIS SHEET.
4. ROUTE CIRCUIT THROUGH CONTACTOR D FOR CONTROL OF BATTING CAGE LIGHTS. SEE DETAIL, THIS SHEET.
5. ROUTE CIRCUIT THROUGH CONTACTOR F FOR CONTROL OF BATTING CAGE LIGHTS. SEE DETAIL, THIS SHEET.
6. ROUTE CIRCUIT THROUGH CONTACTOR G FOR CONTROL OF BATTING CAGE LIGHTS. SEE DETAIL, THIS SHEET.
7. VERIFY BATTING CAGE SWITCHBANK LOCATION WITH OWNER PRIOR TO ROUGH-IN.
8. JUNCTION BOX WITH DISCONNECTING MEANS PER NEC FOR CONNECTION TO BUILDING MOUNTED SIGNAGE. VERIFY EXACT LOCATION AND CONNECT TO SIGN PER MANUFACTURER'S INSTRUCTIONS. ROUTE CIRCUIT THRU TIMECLOCK, SEE DETAIL, THIS SHEET.
9. ROUTE THRU EXTERIOR LIGHTING CONTROLS. SEE DETAIL, THIS SHEET.



LIGHTING CONTROL DIAGRAM
SCALE: NONE



EXTERIOR LIGHTING CONTROL DIAGRAM
SCALE: NONE

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MISSOURI PE COA #2009003629

BC ENGINEERS INCORPORATED
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sheet number
E1
LIGHTING PLAN

drawing type
permit
project number
20231

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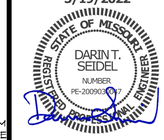
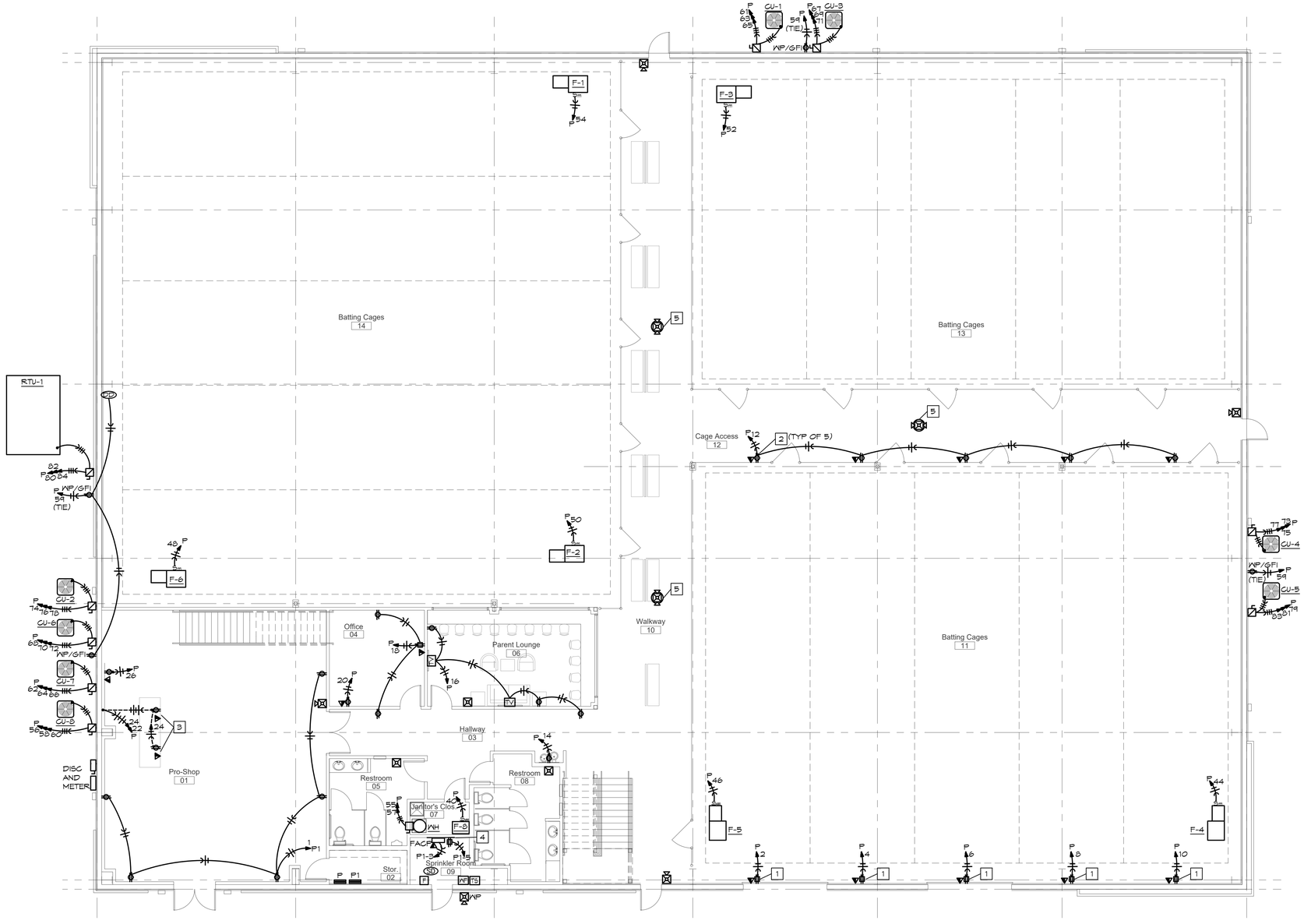


POWER PLAN NOTES:

1. PROVIDE QUAD RECEPTACLE AND DATA TO EACH PITCHING MACHINE. EACH MACHINE REQUIRES (2) ETHERNET CABLES AND (1) MULTI CABLE WIRE, SUPPLIED BY PITCHING MACHINE COMPANY, IN CONDUIT FROM THE PITCHING MACHINE TO THE CARD OPERATED BOX KIOSK. VERIFY ALL ELECTRICAL SPECIFICATIONS WITH PITCHING MACHINE COMPANY PRIOR TO ROUGH-IN.
2. VERIFY LOCATION OF CARD OPERATED BOX KIOSK WITH OWNER PRIOR TO ROUGH-IN.
3. VERIFY EXACT LOCATION OF ELECTRICAL DEVICES IN MOUNTED IN CASEWORK.
4. VERIFY LOCATION OF 2'X4'X3/4" FIRE RETARDANT PLYWOOD TELEPHONE BACKBOARD WITH GROUND BAR AND #6 CU BOND TO BUILDING ELECTRODE SYSTEM PROVIDE 4" C TO PROPERTY LINE FOR BUILDING TELEPHONE AND INTERNET SERVICE TERMINATE AS DIRECTED BY SERVICE PROVIDER. VERIFY ROUTING AND DISTANCE.
5. PENDANT MOUNT FIRE ALARM DEVICE.



NORTH

ELECTRICAL POWER PLAN

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

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a new development for

Town Centre Lot 1

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sheet number E2
POWER PLAN

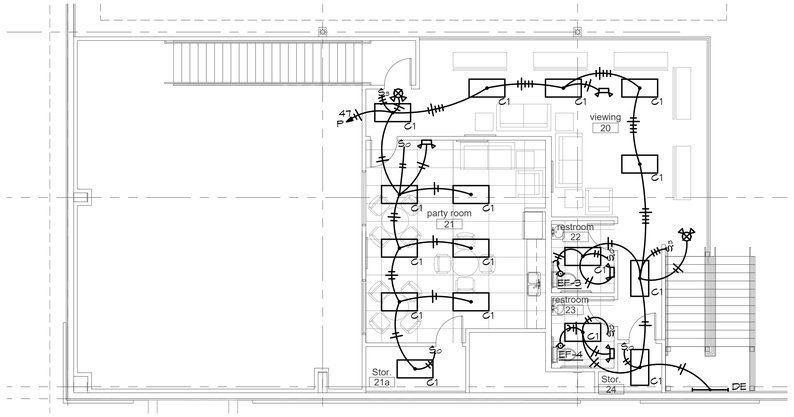
drawing type permit

project number 20231

LIGHT FIXTURE SCHEDULE

MARK NO.	MANUFACTURER & CATALOG NUMBER	VOLTS WATTS	LIGHT SOURCE	DESCRIPTION	EQUIVALENT MANUFACTURERS
A	LUX DYNAMICS IK10 SERIES E 3 D A 850 4 U10 CP B XXY X GYM	120 229	LED 36,000LUM 5000K	3 LIGHT BAR 2 CHANNEL LED 36,000 LUMEN, 5,000 KELVIN, 2-POINT Y CABLE MOUNT, VERIFY FINISH COLOR. MOUNT BOTTOM OF FIXTURE AT 22' AFF. ORDER CABLE TO LENGTH REQUIRED	WILLIAMS COLUMBIA OR EQUAL
B	LUX DYNAMICS IK10 SERIES E 1 S A 850 4 U10 CP B XXY X GYM	120 78	LED 11,000LUM 5000K	1 LIGHT BAR 1 CHANNEL LED 11,000 LUMEN, 5,000 KELVIN, 2-POINT Y CABLE MOUNT, VERIFY FINISH COLOR. MOUNT BOTTOM OF FIXTURE AT 22' AFF. ORDER CABLE TO LENGTH REQUIRED	WILLIAMS COLUMBIA OR EQUAL
BE	LUX DYNAMICS IK10 SERIES E 1 S A 850 4 U10 CP B E15 XXY X GYM	120 78	LED 11,000LUM 5000K	1 LIGHT BAR 1 CHANNEL LED 11,000 LUMEN, 5,000 KELVIN, 2-POINT Y CABLE MOUNT WITH EMERGENCY DRIVER, 2,561 LUMEN. VERIFY FINISH COLOR. MOUNT BOTTOM OF FIXTURE AT 22' AFF. ORDER CABLE TO LENGTH REQUIRED	WILLIAMS COLUMBIA OR EQUAL
C	LITHONIA EPANL 2X4 4000LM 80CRI 50K EZT MVOLT	120 38	LED 4000LUM 5000K	LED FLAT PANEL, 4000 LUMEN, 5000 KELVIN, VERIFY MOUNTING REQUIREMENTS AND HEIGHTS	WILLIAMS COLUMBIA OR EQUAL
C1	LITHONIA EPANL 2X4 3000LM 80CRI 50K EZT MVOLT	120 29	LED 3000LUM 5000K	LED FLAT PANEL, 3000 LUMEN, 5000 KELVIN, VERIFY MOUNTING REQUIREMENTS AND HEIGHTS	WILLIAMS COLUMBIA OR EQUAL
DE	LITHONIA CLX L48 4000LM SEF RDL 120 EZ1 40K 80CRI PS10350 WH	120 28	LED 4000LUM 4000K	4' LED STRIP FIXTURE WITH ROUND LENS, 4000 LUMEN, 4000 KELVIN, WALL MOUNTED	WILLIAMS COLUMBIA OR EQUAL
W	EXISTING EXTERIOR SCONCE	120	LED LUM K	LED SCONCE	
W1	CREE LIGHTING XSPA-B-WM-4ME-AL-40K-UNV	120 31	LED 4270LUM 4000K	WALL MOUNTED LED BUILDING LIGHT WITH TYPE IV MEDIUM THROW OPTIC. VERIFY FINISH COLOR WITH ARCHITECT	
SA	CREE LIGHTING OSQ-M-B-9L-40KT-4M-UNV-NM MOUNT-SQG-ML-B-DA SHIELD-OSQ-BLSMF POLE-SSS-4-11-12-GW-B5-1D-C	120 130	LED 7075LUM 4000K	POLE MOUNTED WITH HOUSE SIDE SHIELD LED AREA LIGHT WITH TYPE IV MEDIUM THROW OPTIC. MOUNT ON 12'X4" SQUARE STEEL POLE WITH 3' CONCRETE BASE. VERIFY FINISH COLOR WITH ARCHITECT	
SB	CREE LIGHTING OSQ-M-B-9L-40KT-5Q-UNV-NM MOUNT-SQG-ML-B-DA POLE-SSS-4-11-12-GW-B5-2D18-C	120 120	LED 10250LUM 4000K	POLE MOUNTED LED 180 DEGREE AREA LIGHT WITH TYPE V SQUARE OPTIC. MOUNT ON 12'X4" SQUARE STEEL POLE WITH 3' CONCRETE BASE. VERIFY FINISH COLOR WITH ARCHITECT	
	DUAL-LITE EV2	120 1	INCL	EMERGENCY LIGHT WITH TWIN ADJUSTABLE 1 WATT LED HEADS AND BATTERY, MOUNT AT 7'-6"±, TO CLEAR OBSTACLES. (PROVIDES 1 FC AVG. ON 2T CENTER FIXTURE SPACING)	SURE-LITES LITHONIA OR EQUAL
	DUAL-LITE EVE-U-R-W-VR53	120 1	INCL	EXIT LIGHT WITH LED LAMPS, RED LETTERS ON WHITE BACKGROUND, UNIVERSAL MOUNT, BATTERY BACKUP, WITH VANDAL RESISTANT SHIELD	SURE-LITES LITHONIA OR EQUAL
	DUAL-LITE EVC-U-R-W-VR53	120 3	INCL	COMBINATION EMERGENCY/EXIT LIGHT WITH LED LAMPS, RED LETTERS ON WHITE BACKGROUND, TWIN LED EMERGENCY LIGHT HEADS, UNIVERSAL MOUNT, BATTERY BACKUP, WITH VANDAL RESISTANT SHIELD	SURE-LITES LITHONIA OR EQUAL
	DUAL-LITE EVC-U-R-W-D4-VR53 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, VANDAL RESISTANT SHEILD AND REMOTE TWIN HEAD OUTDOOR RATED FIXTURE	SURE-LITES LITHONIA OR EQUAL
EX	LITHONIA AFF-QEL-XX-UVOLT-LTP-SDRT-WT-CA	120 12	LED INCL 4000K	ARCHITECTURAL EXTERIOR LED EMERGENCY LIGHT WITH COLD WEATHER BATTERY, COORDINATE FINISH TO MATCH BUILDING	SURE-LITES LITHONIA OR EQUAL

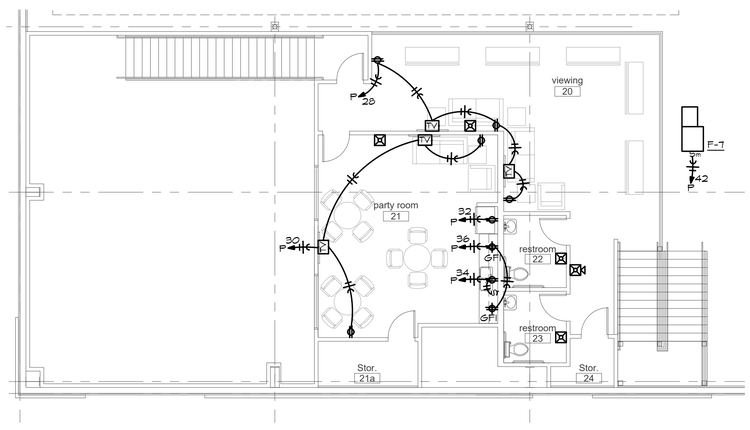
NOTES:



NORTH

ELECTRICAL MEZZANINE LIGHTING PLAN

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



NORTH

ELECTRICAL MEZZANINE POWER PLAN

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

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5/19/2022

STATE OF MISSOURI
REGISTERED
DARIN T. SEIDEL
NUMBER
PE-2009003629
PROFESSIONAL ENGINEER

a new development for
Town Centre Lot 1
520 NE Town Centre Drive
Lee's Summit, Missouri 64064

date
05.19.22
drawn by
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BC PROJECT #: 22323
MISSOURI PE COA #2009003629

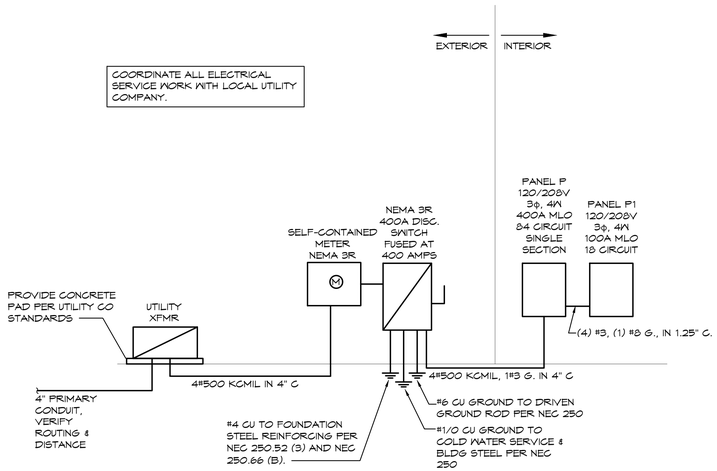
BC ENGINEERS INCORPORATED
5720 Reeder Shawnee, Ks. 66203 (913)262-1772

sheet number
E3
MEZZANINE PLAN
drawing type
permit
project number
20231

PANEL: P		VOLTS: 120/208V			PH: 3Ø		WIRE: 4W		LOCATION: STORAGE				MOUNTING: SURFACE	
BUS: 400A		MAIN: 400A 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	BATTING CAGE LTG	20	1	12	1,145			360			12	1	20	PITCHING MACHINE	2
3	BATTING CAGE LTG	20	1	12		1,145			360		12	1	20	PITCHING MACHINE	4
5	BATTING CAGE LTG	20	1	12			1,145			360	12	1	20	PITCHING MACHINE	6
7	BATTING CAGE LTG	20	1	12	1,145			360			12	1	20	PITCHING MACHINE	8
9	BATTING CAGE LTG	20	1	12		1,145			360		12	1	20	PITCHING MACHINE	10
11	BATTING CAGE LTG	20	1	12			916			900	12	1	20	PITCHING MACHINE KIOSKS	12
13	BATTING CAGE LTG	20	1	12	916			600			12	1	20	DRINKING FOUNTAIN [GF]	14
15	BATTING CAGE LTG	20	1	12		916			900		12	1	20	PARENT LOUGE RCPT	16
17	BATTING CAGE LTG	20	1	12			916			720	12	1	20	OFFICE RCPT	18
19	BATTING CAGE LTG	20	1	12	916			600			12	1	20	OFFICE COPIER	20
21	BATTING CAGE LTG	20	1	12		687			180		12	1	20	PRO-SHOP POS RCPT	22
23	BATTING CAGE LTG	20	1	12			687			180	12	1	20	PRO-SHOP POS RCPT	24
25	BATTING CAGE LTG	20	1	12	687			600			12	1	20	PRO-SHOP COPIER	26
27	BATTING CAGE LTG	20	1	12		687			900		12	1	20	VIEWING RCPT	28
29	BATTING CAGE LTG	20	1	12			687			720	12	1	20	PARTY ROOM RCPT	30
31	BG LTG CONTACTORS	20	1	12	200			1,000			12	1	20	PARTY ROOM FRIDGE [GF]	32
33	PRO-SHOP/OFFICE LTG	20	1	12		777			200		12	1	20	PARTY ROOM DISPOSAL [GF]	34
35	HALL/CAGE ACCESS LTG	20	1	12			1,130			360	12	1	20	PARTY ROOM COUNTER RCPT	36
37	FRONT SIGNAGE	20	1	12	1,200			1,200			12	1	20	SIDE SIGNAGE	38
39	EXTERIOR TIMECLOCK	20	1	12		200			1,800		12	1	15	F-8	40
41	EXTERIOR WALL SCONCES	20	1	12			480			1,800	12	1	15	F-7	42
43	EXT BUILDING/SITE LTG	20	1	10	873			1,800			12	1	15	F-4	44
45	SITE LTG	20	1	10		760			1,800		12	1	15	F-5	46
47	MEZZANINE LTG	20	1	12			526			1,800	12	1	15	F-6	48
49	PANEL P1	100	3	3	720			1,800			12	1	15	F-2	50
51						360			1,800		12	1	15	F-3	52
53							200			1,800	12	1	15	F-1	54
55	WATER HEATER	30	2	10	2,250			1,452							56
57						2,250			1,452		12	3	20	CU-8	58
59	EXTERIOR CONV RCPT	20	1	12			720			1,452					60
61	CU-1	35	3	8	2,544			2,208							62
63						2,544			2,208		10	3	30	CU-7	64
65							2,544			2,208					66
67	CU-3	35	3	8	2,544			2,208							68
69						2,544			2,208		10	3	30	CU-6	70
71							2,544			2,208					72
73	CU-4	35	3	8	2,544			2,544							74
75						2,544			2,544		8	3	35	CU-2	76
77							2,544			2,544					78
79	CU-5	35	3	8	2,544			9,360							80
81						2,544			9,360		3	3	100	RTU-1	82
83							2,544			9,360					84
NOTES:					20,228	19,103	17,583	26,092	26,072	26,412					
(GF)-GFCI BRKR 5mA					46,320		45,175		43,485					TOTAL CONNECTED LOAD:	135,480 VA
														NEC DEMAND LOAD:	126,757 VA
														DEMAND AMPS @ 208 VOLT / 3Ø:	351.54 A

PANEL: P1		VOLTS: 120/208V			PH: 3Ø		WIRE: 4W		LOCATION: STORAGE				MOUNTING: SURFACE	
BUS: 125A		MAIN: 100A 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	PRO-SHOP CONV RCPT	20	1	12	720							1	20	SPARE	2
3	PHONEBOARD RCPT	20	1	12		360						1	20	SPARE	4
5	FACP [HL]	20	1	12			200					1	20	SPARE	6
7	SPARE	20	1									1	20	SPARE	8
9	SPARE	20	1									1	20	SPARE	10
11	SPARE	20	1									1	20	SPARE	12
13	SPARE	20	1									1	20	SPARE	14
15	SPARE	20	1									1	20	SPARE	16
17	SPARE	20	1									1	20	SPARE	18
NOTES:					720	360	200	0	0	0					
[HL]-HANDLE LOCK					720		360		200					TOTAL CONNECTED LOAD:	1,280 VA
														NEC DEMAND LOAD:	1,280 VA
														DEMAND AMPS @ 208 VOLT / 3Ø:	3.55 A

COORDINATE ALL ELECTRICAL SERVICE WORK WITH LOCAL UTILITY COMPANY.



ELECTRICAL RISER DIAGRAM

SCALE: NONE

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5/19/2022

STATE OF MISSOURI REGISTERED PROFESSIONAL ENGINEER
DARIN T. SEIDEL
NUMBER PE-2009003629

Town Centre Lot 1

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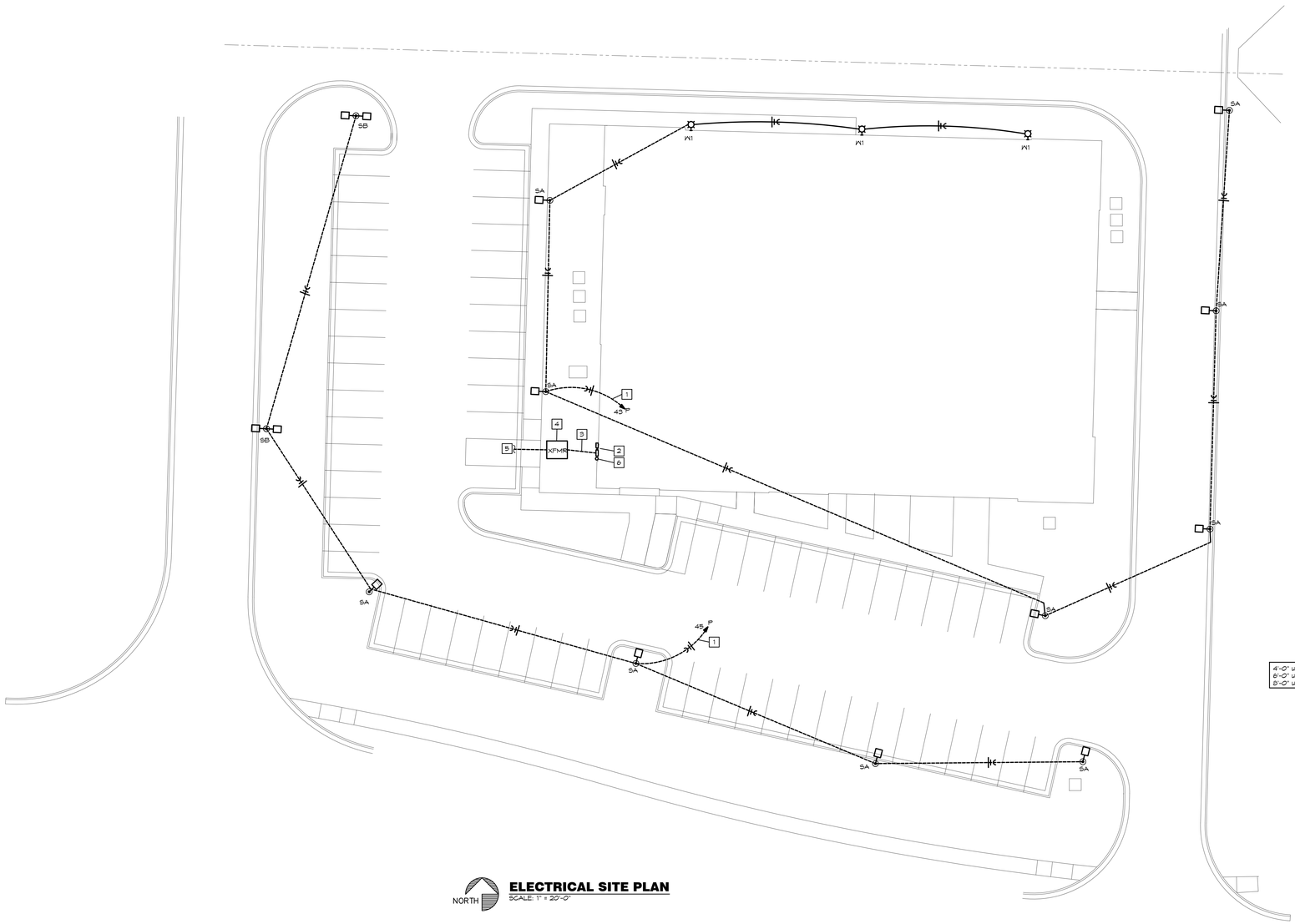
BC PROJECT #: 22323
MISSOURI PE COA #2009003629

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

sheet number
E4
RISER DIAGRAM, DETAILS AND PANEL SCHEDULES
drawing type
permit
project number
20231

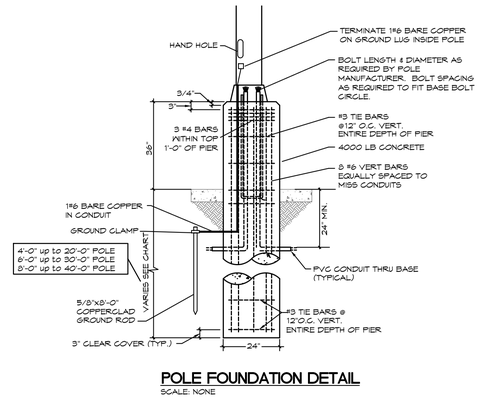


NORTH

ELECTRICAL SITE PLAN
SCALE: 1" = 20'-0"

SITE PLAN NOTES:

1. ROUTE THRU EXTERIOR LIGHTING CONTACTOR, SEE DETAIL, SHEET E1.
2. PROPOSED LOCATION OF ELECTRICAL SERVICE ENTRANCE GEAR. REFER TO RISER DIAGRAM, SHEET E4 FOR MORE INFORMATION.
3. ELECTRICAL PRIMARY CONDUIT AS DIRECTED BY LOCAL UTILITY CO. REFER TO RISER DIAGRAM, SHEET E4 FOR MORE INFORMATION.
4. PROPOSED LOCATION OF PAD MOUNTED TRANSFORMER. REFER TO RISER DIAGRAM, SHEET E4 FOR MORE INFORMATION.
5. ELECTRICAL SECONDARY FEEDER. REFER TO RISER DIAGRAM, SHEET E4 FOR MORE INFORMATION.
6. PHONE DEMARK AND INTERNET PROVIDER, VERIFY LOCATION AND CONDUIT REQUIREMENTS WITH SERVICE PROVIDERS.



POLE FOUNDATION DETAIL
SCALE: NONE

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