



City of Cape Girardeau

Development Services Department
401 Independence Street
Cape Girardeau, MO 63701

Plan Review Services

CITY *of* **CAPE** **G I R A R D E A U**

Request for Proposals

All proposals shall be submitted to:
Anna Kangas
Transformation Manager
401 Independence Street
Cape Girardeau, MO 63701

Published: Friday, July 31, 2020
Due Date: Friday, August 28, 2020

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Background

The City of Cape Girardeau, population approximately 40,000, is located in Cape Girardeau County, in Southeast Missouri. The City council consists of a Mayor and six Council members. The City operates under a City Manager form of Government.

The Inspection Services Division is part of the Development Services Department, along with Engineering, Planning and GIS. Inspection Services staff includes a building & code enforcement manager, plan reviewer, permit technician, two building inspectors, and two inspectors for property maintenance and the city's residential rental program.

General Information

The City of Cape Girardeau experiences fluctuations in the amount and complexity of building plans submitted for commercial plan review. In order to improve customer service and reduce response times, the City seeks to contract the services of a licensed architect, professional engineer, or ICC Building Plans Examiner to provide as-needed commercial plan review services for 6 months with an option to renew for an additional 6 months.

The purpose of this Request for Proposal (RFP) is for the City of Cape Girardeau to receive responses from qualified individuals or firms for commercial plan review services. Please return your proposal by August 28, 2020 by 4 pm (CST) electronically to akangas@cityofcape.org or by mail to: Attn: Anna Kangas, Transformation Manager, City of Cape Girardeau, 401 Independence Street, Cape Girardeau, MO 63703 demonstrating your qualifications to meet criteria contained herein.

Please contact Transformation Manager Anna Kangas with any questions, at (573) 339-6613, or akangas@cityofcape.org.

Scope of Services

The selected firm will provide personnel to fulfill the duties of the position of commercial plan reviewer and to perform other related duties as directed by the Building & Code Enforcement Manager.

Primary Work:

- (1) Review of building plans for commercial new, addition, and renovation building permits for compliance with the codes adopted by the City, as amended, updated or otherwise modified by Chapter 7 of the City's Code of Ordinances:
 - a. 2015 International Building Code
 - b. 2015 International One and Two Family Residential Code
 - c. 2015 International Plumbing Code
 - d. 2015 International Mechanical Code
 - e. 2015 International Fuel Gas Code
 - f. 2015 International Fire Code
 - g. 2015 International Existing Building Code
 - h. 2015 International Swimming Pool & Spa Code
 - i. 2014 National Electric Code
 - j. 2009 International Energy Conservation Code
- (2) Review of commercial building plans for new, addition and renovation building permits for compliance with the city's Zoning Code, Chapter 30 of the City's Code of Ordinances, as they pertain to building height, setback and permitted uses.

Workflow:

- (1) The City utilizes Avolve's ProjectDox digital plan review software, which can be accessed through a web browser. The city also reviews paper plans. Plans are expected to be reviewed, and comments returned to city staff for coordination with other comments, within 10 business days of receipt of plans. Other staff is responsible for reviewing site plans, stormwater, solar/PVS systems, generators, single-family and duplexes, and applications for miscellaneous items such as fences, signs, etc.
- (2) The completed plan review checklist (Exhibit A of this RFP) for each project shall be returned to the city with the list of plan review comments, to be maintained with the permit documentation. Each plan review comment shall reference a specific code book and section, and reference the sheet number and detail number on the plans, where applicable.
- (3) The commercial plan reviewer is expected to respond to questions, as they pertain to plan review comments, from city staff and citizens within 24 hours. The Building & Code Enforcement Manager shall be copied on all written correspondence, and provided with a written summary of phone conversations on at least a daily basis.
- (4) Plan review for renovation projects typically requires 2 to 4 hours of review time; new construction and large addition projects typically require 6 to 8 hours of review time. More or less time may be required depending on size and complexity of the project. In 2018, the city reviewed 79 commercial renovations and 23 new commercial projects. In 2019, the city reviewed 65 commercial renovations and 27 new commercial projects. In 2020 so far, the city has reviewed 30 commercial renovations and 14 new commercial projects. The plan review workload will be distributed between the city's plan reviewer and the contracted commercial plan reviewer to maintain response times.

Other Services

- (1) The commercial plan reviewer shall answer building code questions from City staff and customers by email and/or phone.
- (2) The commercial plan reviewer shall attend the weekly Inspection Services staff meeting, either in person or by phone, for the purpose of providing an update on plan reviews in process. This meeting is typically held at 8 a.m. on Thursday, in the Development Services Conference Room.
- (3) The commercial plan reviewer shall attend Board of Appeals meetings related to building code appeals resulting from the plan reviewer's comments. Board of Appeals meetings are held the 2nd Thursday of each month at 7 p.m. in the City Council Chambers, unless there are no agenda items.
- (4) Assistance in reviewing the 2020 National Electric Code and 2021 International Codes, and recommendation of amendments prior to adoption by the City. This may require compiling comments for staff review, attending Board of Appeals meetings, contractor information meetings, and City Council meetings to present the codes and answer questions. Board of Appeals meetings are held the 2nd Thursday of each month at 7 p.m. in the City Council Chambers, unless there are no agenda items. Contractor information meetings are typically held during normal business hours in the City Council Chambers. City Council meetings are held on the 1st and 3rd Monday of each month, at 5 p.m. in the City Council Chambers.

- (5) The commercial plan reviewer may advise the building inspectors or other plan reviewers through telephone conferences, meetings, and correspondence of code interpretations.
- (6) The commercial plan reviewer may be requested to attend preliminary design meetings in-person or by conference call with other city staff, design consultants, developers, and project owners for proposed projects.

A professional services agreement entered into by and between the City and commercial plan reviewer shall specify the scope of included services. The City anticipates the negotiation of the scope of services and the format of payment for such services shall be a collaborative undertaking between the City and the successful respondent, but requests each respondent provide a proposal outlining their suggested approach (e.g. monthly retainer for a specified amount of work; hourly; hourly plus expenses; blended approach; etc.)

Invoicing

The respondent shall submit an itemized invoice indicating the number of hours spent on each plan review. In general, invoices received by the 20th of the month will be paid by the 10th of the following month, but this schedule may be discussed and adjusted with the selected respondent.

Submittal Requirements

The response to this RFP must be organized according to the following format. Information should be concise and specific to address each request and be limited to a total of 15 sheets of paper.

1. Contain a letter of interest (no more than one page long);
2. Provide the name of each licensed design professional or ICC Building Plans Examiner proposed to provide services to the City and the name of the individual who will have the main contact with the City. The lead professional must be licensed to practice in the State of Missouri, with at least five (5) years experience practicing as a licensed architect or engineer, or possess a valid ICC Building Plans Examiner certification with at least 5 years experience as a plans examiner. Provide the individual's professional license number or ICC certificate number. Experience representing on the behalf of local government(s) is highly desired;
3. Provide information about the Respondent's experience in providing commercial plan review services to Missouri local governments. List similar engagements that have been completed by the assigned persons within the past three years.
4. If the Respondent has not previously provided commercial plan review services, provide at least three references from building departments in Missouri local government organizations including names, contact persons, and phone numbers, where the Respondent has submitted plans for commercial plan review including the names and addresses of at least three projects completed in each jurisdiction.
5. Provide information about the Respondent's capacity and capability to perform on short notice and in a timely manner, and the Respondent's proposed approach to communicating with City of Cape Girardeau;

6. Describe any conflicts of interest or ethical considerations you may have in providing these services for the City of Cape Girardeau. As a part of your response, please provide information related to representation or affiliation with any boards, organizations, committees, or clients, including, but not limited to, the City of Cape Girardeau, other municipalities, governmental, and/or quasi-governmental entities;
7. The location of staffing and firm resources expected to be made available to serve the City of Cape Girardeau;
8. Information on the Respondent's ability to handle the assigned work with the current staff and the workload already assigned to the key persons;

Selection Criteria

A City review team will evaluate each submission based upon the criteria stated in this Request for Proposal and the ability to execute the services. If necessary, the top individuals or firms will be invited to an interview the week following the submittal deadline. Following the evaluation process, the team will then select the firm the City considers most qualified and negotiate a fee. The City reserves the right to negotiate modifications to the RFP it deems acceptable. The City reserves the right to terminate this process in the event it deems the progress towards a contract to be insufficient. Firms will be evaluated in accordance with the weighted criteria listed below.

Criteria Weight

1. Experience and qualifications; no conflicts	30%
2. Past performance and references	20%
3. Understanding of the City's Needs	20%
4. Location of Firm and Staff Assigned to this Project	15%
5. Overall Ability to Execute Services	15%
TOTAL	100%

Schedule

Consultants must be able to accommodate the following schedule:

<u>RFP's due by 4:00 p.m.</u>	<u>Friday, August 28, 2020</u>
<u>Consultants on short list notified by</u>	<u>Wednesday, September 2, 2020</u>
<u>Interviews</u>	<u>week of September 14, 2020</u>
<u>Final selection by</u>	<u>Wednesday, September 23, 2020</u>
<u>Final agreement submitted by</u>	<u>Friday, October 9, 2020</u>
<u>City Council authorization of agreement</u>	<u>Monday, October 19, 2020</u>

Plan Review Checklist – General Commercial

Date: _____

Permit Number: _____

Zoning: _____

Project Name: _____

Use Group: _____

Required Setbacks:

Front: _____

Rear: _____

Side: _____

Project Address: _____

Is this a permitted use for the
Zoning district?

Does this require a special use
permit?

Construction Type: _____

Work with GIS if multiple
suites/addresses are required

Location/Vicinity Map

____ Date Stormwater Review completed

____ Date Site Plan Review completed

____ Variances required?

____ Notify of fence permit

____ Notify of sign permit

____ IBC 2015 family, NEC 2014

Title Block Requirements

Current license for:

____ Architect

____ Civil Engineer

____ Structural Engineer

____ Mechanical Engineer

____ Electrical Engineer

____ Plumbing Engineer

____ Fire Protection

COA for:

____ Architecture

____ Civil Engineering

____ Structural Engineering

____ Mechanical Engineering

____ Electrical Engineering

____ Plumbing Engineering

____ Firm name, address, phone #

____ Signed, sealed and dated

IBC 2015

Table 504.3

Allowable Height: _____

Provided Height: _____

Table 504.4

Allowable Stories: _____

Provided Stories: _____

Table 506.2

Allowable Area: _____

Provided Area: _____

506 Area Modifications

Frontage Increase: _____

Sprinkler Increase: _____

Total Allowable Area: _____

Chapter 3 Use Groups

402 Mall Buildings
 404 Atriums
 405 Underground Buildings
 406 Vehicle Related
 407 I-2
 408 I-3
 409 Projector rooms
 410 Stages and Platforms
 412 Aircraft Related

- 509 Incidental uses requiring separation
- 508.4 Required Separation of Occupancies
- Table 601 Fire Resistance of Building Elements

	Req'd	Provided
Structural Frame	—	—
Bearing Walls Int.	—	—
Bearing Walls Ext.	—	—
Nonbearing Walls Int.	—	—
Floor construction	—	—
Roof construction	—	—

- Table 602 Fire Resistance for Exterior Walls

Rating	Req'd	Provided
$X < 5'$	—	—
$5' \leq x \leq 10'$	—	—
$10' \leq x \leq 30'$	—	—
$x \geq 30'$	—	—

- Table 705.8 Fire separation distance and exterior wall openings

706 Fire Walls

- Table 706.4 Fire resistance ratings between Use Groups

707 Fire Barriers

- Table 707.3.10 Fire resistance ratings between Use Groups
- Table 716.5 Fire door ratings
- 718.2 Fire blocking
- 718.3, 718.4 Draft stopping

903 Automatic Sprinkler Systems

- 903.2 Where automatic sprinkler systems are required
- 1004.3 Occupant Load Posted in all Assembly area

- 423 Storm Shelters
- 420 I-1, R-1, R-2, R-3, R4
- 505 Mezzanines
- 507 Unlimited Area Buildings

Occupancy	Req'd s.f.	Provided s.f.	Occ. Load
—	—	—	—
—	—	—	—
—	—	—	—
—	—	—	—

1005 Egress Width

- .3"/occupant or .2"/occupant if provided with fire sprinklers and a voice/alarm system for stairways
- .2"/occupant or .15"/occupant if provided with fire sprinklers and a voice/alarm system for other egress components
- Reduced capacity does not apply to H and I-2 occupancies
- Door swings cannot reduce egress width more than 7"

1006 and 1007 Exit Doorways

- Table 1006.2.1 Max occupancy and egress distance with or without sprinklers
- Table 1006.3.2(2) Max Occupant Load for 1 doorway
- >1 exit, > 1/2 the diagonal distance of the room served
- >1 exit, with fire sprinkler, 1/3 the diagonal distance of the room served
- 1006.2.2.1 and 1006.2.2.2 exit for mech rooms

1010 Doors, Gates

- Means of Egress Doors Min 32"
- Swing in direction of travel for > 50, or H occ.
- Landing each side of door at same elevation
- Landings > 44" in direction of travel
- Space between doors: 48" + width of door

1011 Stairways

- 44" min width
- Less than 50 occ, 36" width
- Not req'd to be solid risers if not accessible means of egress
- Handrails on each side

1012 Ramps

- 1:12 to 1:8 (8.3% to 12.5%)
- 30" max rise
- 2% max cross slope
- 36" min width between handrails
- Landings at top, bottom, turns, doors
- Landing 60" min length
- 6" rise, handrails req'd
- Edge protection: 4" min height or 12" beyond rail

1015 Guards

- if > 30" to surface below
- 42" min height
- 4" max openings, 6" max at triangular openings
- Req'd at rooftop mechanical equipment, within 10' of edge
- 1015.8 windows in group R-2 and R-3 require window opening limiting devices if top of sill is <36" aff and >72" afg

1017 Exit Travel Distance

- Table 1017.2 Travel Distance Max
Allowed _____ Provided _____

1018 Aisles

- Groups B & M: Table 1020.2
- Group M: 30" min aisle accessway

1020 Corridors

- Table 1020.1 Corridor Fire Resistance Rating
- 44" min. width
- 36" min. if < 50 occupants
- 1020.4 Dead end corridors

1022 Exits

- Table 1006.3.1 Min exits for Occupant load
- Table 1006.2.1 Max occupants for 1 exit

1029 Assembly Exits

- > 300 occupants, main exit to accommodate 1/2 of load
- Balcony with >50 occupants, 2 exits required
- 1030.2.1 Min. height of emergency windows: 24"

1105 Accessible Entrances

- >60% of public entrances shall be accessible

1106 Parking Facilities

- Table 1106.1 Min. Accessible Parking spaces
- 1 van space per 6 required accessible parking spaces
- 1107 Min. # of Accessible Units

1108 Special Occupancies

- Table 1108.2.2.1 Accessible Seating
- 1108.2.3 Companion seat at each WC space
- 1108.2.4 Disperse WC spaces

1109 Other Features & Facilities

- 1109.2 1 Toilets for private offices not req'd to comply with ANSI 117.1
- 1109.2 4 If 1 urinal, not req'd to be accessible
- 1109.2.1 In A&M occupancies, 1 family toilet req'd for 6 or more req'd toilets
- 1109.2.1.4 Family toilet < 500' from single sex toilet
- 1109.4 Kitchenettes req'd to be accessible
- 1109.11 >5% of work surfaces to be accessible

1205 Lighting

- Natural or artificial lighting req'd

1209 Access to Unoccupied Spaces

- 18x24 Crawlspace access
- 20x30 attic access
- 2902.3.1 Toilet rooms cannot open directly into kitchens
- 1503.6 Crickets req'd at ridge side of roof penetrations >30" wide
- 1507 Roof covering req'mts
- Ice guards at pedestrian walkways, on metal roofs

1600 Structural Design

- Floor live load (Table 1607.1)
- Roof live load (Table 1607.1)
- Ground snow load (P_g) (Figure 1608.2, for Cape: 15 psf)
- Flat-roof snow load (P_f)
- Snow exposure factor (C_e)
- Snow load important Factor (I)
- Thermal Factor (C_t)
- Basic Wind speed (3 second gust) (Figure 1609, for Cape: 115 mph)
- Wind Exposure
- Wind Risk Category (Table 1604.5)
- Internal pressure coefficient
- Design wind pressures for exterior materials
- Seismic Design Category
- Site Class
- Seismic Importance Factor
- Seismic Risk Category
- Mapped Spectral Response Accelerations (S_s and S_1)
- Spectral response coefficients (S_{DS} and S_{D1})
- Basic seismic-force-resisting systems
- Design base shear
- Seismic response coefficients (C_s)
- Response modification factors (R)
- Analysis procedure used
- Soil load bearing values
- Flood design data if in flood hazard area
- 1607.5 Partition loads in office buildings: 15 psf

1804 Excavation, Grading and Fill

- 1804.4 Ground to slope 5% for first 10' adjacent to foundation
- Impervious surfaces to slope 2% for first 10' adjacent to foundation

1805 Dampproofing and Waterproofing

Dampproofing

- 1805.2.1 At floors, ≥6 mil polyethylene with 6" lapped joints
- 1805.2.2 On walls, 1/8" bituminous from T.O. footing to above ground level

Waterproofing

- 1805.3.1 At floors, ≥6 mil asphalt, rubber, HDPE or PVC w/ 6" lapped joints
- 1805.3.2 On walls, ≥6mil PVC or polyethylene, or 40 mil asphalt
- 1805.4 Drain around foundation perimeter
- 1805.4.1 ≥4" base course under basements
- 1805.4.2 Fdn. Drain extend 12" beyond ftg. 2" gravel below and 6" gravel above drain.

1809 Shallow Foundations

- 1809.4 Min depth of footings: 12", min width: 12"
- Min 18" to b.o. footing per City
- 1904 Min Compressive Concrete Strength
- 1905.1 Min basement and fdn wall thickness: 7.5" Refers to ACI 318-14 14.1.4
- Table 2304.8(3) Allowable sheathing spans
- Table 2304.10.1 Fastening schedule
- 2304.12 Locations of preservative-treated wood
- 2304.12.1.5 6" min between wood siding and grade
- 2308.3.1 Foundation sill plates anchored with 1/2" diameter bolts, 7" embed, no more than 6' o.c.
- Table 2308.5.11 Min Wall Sheathing thickness

2406.4 Safety glazing required in hazardous locations:

- Swinging doors
- Sliding doors, including fixed panes
- Storm doors
- Unframed swinging doors
- Doors for showers, tubs, saunas, etc
- Glass within 24" circle of door when glass is within 60" aff
- Glazing in a fixed or operable panel within certain dimensions
- Guards or railings
- Glazing around pools, spas, etc

- When Glazing within 60" of pool
- Glazing adjacent to stairs, ramps, landings within certain dimensions

Safety glazing:

tempered

laminated

impact resistant plastic

Wired glass: only if complies with CPSC 16 CFR 1201 Category I & II

- 2509.2 Base for tile: glass mat water resistant panels, fiber cement or fiber-mat reinforced cement

2702 Emergency Power Systems req'd:

- Group A emergency voice/alarm systems
- Smoke control systems
- Exit signs
- Means of egress illumination
- Accessible Means of egress elevators and platform lifts
- Horizontal Sliding doors
- Semiconductor fabrication facilities
- Inflation systems for membrane structures
- Occupancies with:
- Hazardous materials
- Toxic materials
- Organic peroxides/silane gas
- Pyrophoric materials
- Covered mall emergency voice/alarm systems
- Underground buildings
- Group I-3 doors
- Elevators
- Smokeproof enclosures

2902 Plumbing facilities

- 2902.6 Drinking fountains not req'd if less than 16 occupants

Separate facilities per gender unless:

- Less than 16 occupants
- Less than 100 occupants in Group M
- 2902.2.1 Facility is required to have only one restroom for each gender, the two restrooms may be unisex in lieu of specification for each gender
- 2902.3 Public toilets required.
- 1210.3.1 Toilet rooms in daycare or childcare facilities can have one toilet without enclosure
- 1210.3.2 Urinal partitions required

30 Elevators

- 3002.4 If more than 4 stories, one elevator must accommodate ambulance stretcher
- 3005.2 elevator machine rooms require independent HVAC to protect electrical equip.
- 3005.4 elevator machine rooms enclosed with fire barriers
- 3102.3 Noncombustible membrane structures are type IIB
- 3102.5 Membrane structures max one story, unless only roof
- 3102.8.3 Support system req'd for membrane in case of deflation for occ load > 50 or over pool
- 3109 Swimming Pool enclosures (fence and gate req'mts)

ANSI 117.1-2009

- 304.3.1 or 304.3.2: 5'-0" dia. Circle or t-shaped turn around area
- 403.5: Clear Width of accessible route: 36"
- 403.5.1: Clear width at turn: 48"
- 404.2.2: 32" clear width at doorways
- 404.2.3.2 and 404.2.3.3: Clearances each side of doorway diagrams
- 404.2.6: Door Hardware requirements

405: Ramps

- 405.2 1:20 to 1:12 slope
- 405.3 1:48 cross-slope
- 405.6 30" max rise
- 405.9 Edge protection

- 407: Elevators
- 410: Platform Lifts

502: Accessible Parking spaces:

- Access aisles join accessible route
- Aisles for car and van spaces: 60" minimum width

504.2: Treads and Risers:

- Risers: 4" to 7"
- Treads: 11" minimum

504.5: Nosings:

- 1/2" maximum radius
- 1-1/2" maximum projection of nosing
- 504.9: Exit door at stair shall have tactile EXIT sign

505.4: Handrails:

- Height 34" to 38"
- 1-1/2" space between handrail and surface
- 1-1/4" to 2" cross section
- Continuous handrail at inside turn of stairs and ramps

- Extensions at ramps: 12" minimum at top and bottom

Extension at stairs:

- Top: 12" minimum
- Bottom: one tread depth
- 602.2: Clear space at drinking fountain (30" x 48") centered on fountain
- 602.4: Spout outlet height 36" max AFF for wheelchair, 38" to 43" AFF for standing
- 603.3: Mirrors: Bottom of reflecting surface at 40" AFF
- 604.2: Water closet centerline 16" to 18" from wall

Grab Bars:

604.5.1 Side Wall Grab Bars:

- 42" bar, 33" to 36" above floor, 12" from rear wall
- 18" vertical bar, 39" to 41" above floor, 39" to 41" from rear wall

604.5.2 Rear Wall Grab Bars:

- 36" bar, 12" from center of WC to side wall, 24" from center of WC to transfer side
- 609.4 Grab bars: 33" to 36" AFF

604.7 TP Dispensers:

- Uncontrolled delivery
- 24" to 36" from rear wall if above grab bar
- 24" to 42" from rear wall if below grab bar
- 18" to 48" AFF
- 605.2 Urinals: rim 17" max AFF
- 606.3 Front of lavatory/sink 34" max AFF
- 606.6 Insulated supply & drainpipes under sink
- 705.5: Truncated Domes
- 902: Dining Surfaces and Work Surfaces
- 904 Sales and Service Counters

IPC 2015

- 305.1 Pipes through concrete or cinder to be externally protected against corrosion
- 305.4 water supply $\geq$ 24" below grade
 - 305.4.1 Building Sewer $\geq$ 36" below grade if PVC or clay tile, $\geq$ 6" if iron or concrete encased.
- Piping Seismic Supports 308.2
- Table 308.5 Pipe Hanger spacing
- 314.2.1 Condensate drain pipe slope min. 1/8" to 1'

— Table 403.1 Min. Plumbing Fixtures

	Req'd	Provided
WC	_____	_____
Lav	_____	_____
Urinal	_____	_____
DF	_____	_____
SS	_____	_____

- 403.3.3 No more than 500' to restrooms

406 Clothes Washers

- Backflow preventer or integral air gap
- 2" min. trap and fixture drain
- 3" min. branch drain or drainage stack

407 Bathtubs

- 1-1/2" min. waste outlet

409 Dishwashers

- Backflow preventer or integral air gap

410 Drinking Fountains

- Not req'd in restaurants or occupancies of ≤ 15
- < 50% req'd fountains may be replaced by water coolers or bottled water
- Not installed in restrooms

412 Floor and Trench Drains

- Min 2" diameter drain outlet
- Laundry facilities 3" min. drain outlet

413 Food Waste Grinder

- 1-1/2" min waste outlet
- Commercial: separate trap from other fixtures/sinks
- Water supply req'd.

416 Lavatories

- 1-1/4" min. waste outlet
- Water tempering device

417 Showers

- 1-1/2" min. waste outlet
- Min 900 sq. in., min 30" in least dimension
- 417.4.1 Area to 6' aff smooth, noncorrosive, nonabsorbent, min 70" above drain

418 Sinks

- 1-1/2" min waste outlet

419 Urinals

- 419.2 In A&E occupancies, Urinals may replace 67% of toilets. In other occupancies, not more than 50%.
- 419.3 Surrounding material non-absorbent and readily cleanable

420 Water Closets

- 420.2 Public or employee toilets shall be elongated type

423 Specialty fixtures

- 423.1 Backflow prevention
- 424.5 Max 120° hot water to bathtubs and whirlpools

500 Water Heaters

- 502.3 Space req'mts for water heaters in attics
- 504.6 Temperature and Pressure Relief Discharging Piping termination $\leq 6"$ above and $\geq$ two times the discharge pipe diameter above the floor or waste receptor flood level rim
- 504.7 Water heater pan, min 24 ga., 1-1/2" deep, min 3/4" drain pipe

600 Water Service

- 603.1 Min 3/4" water service
- 603.2 Water service and sewer separated by 5'-0", unless supply 12" above sewer.
- Table 604.4 Max flow rates for fixtures
- Table 604.5 Min Water Supply Pipe sizes
- 605.2.1 drinking/cooking water supply pipes $\leq 25\%$ weighted average lead content
- 605.7 valves supplying drinking water shall meet NSF 61 requirements.
- 607.1 Hot water and tempered water req'd for bathing and washing.
- Tempered water, max of 110°
- 607.2.1 Insulation req'd for circulated hot water.
- 607.3 hot water thermal expansion pressure control

700 Sanitary Drainage

- 702.5 Waste water >140 F doesn't need to be cooled is the drainage piping material is rated for the waste water temperature.
- 703.7 Min sewer size: 4"
- Table 704.1 Slopes for drain pipes
- 717 Replacement of Sewers by Pipe-Bursting Method: gravity drainage piping $\leq 6"$
- 906.1 Vent size at least 1/2 diameter of the drain, at least 1-1/4"
- 1003.3.1 Where grease interceptors req'd
- 1003.4 Where oil separators are req'd
- 1003.9 Venting of interceptors and separators

IMC 2015

- 303.3 Fuel-fired appliances not located in: sleeping rooms, bathrooms, toilet rooms, storage closets, surgical rooms
- 303.5 Fuel-fired furnaces, water heaters and boilers installed in closets shall be listed for that installation.
- 303.8 No mechanical equipment in elevator shaft.
- 304.10 Equipment on > 3" concrete above grade

- 304.11 Guards req'd at equipment if 30" AFF or grade.
- 306.1 30"x30" working space in front of each appliance
- 306.2 Doors to appliance rooms min. 36" x 80"
- 306.3 Attic access min. 22" x 30" and large enough for largest equipment
- 306.3.1 Luminaire and receptacle req'd near appliance in attic.
- 306.4 Crawlspace access min 22"x30" and large enough for largest equipment.
- 306.4.1 Luminaire and receptacle req'd near appliance in crawlspace
- 306.5 No obstructions taller than 30" to access rooftop equipment.
- 306.5 Req'mts for permanent ladders and catwalks
- 306.5.2 Receptacle req'd near rooftop unit.
- 307.2.2 Condensate drain $\geq 3/4"$ and cannot decrease in size.
- 307.2.5 condensate drains req'd to be configured or equipped to allow maintenance of drain line without cutting the drain pipe
- 401.4 Air intake $\geq 10'$ from lot lines or buildings, or contaminant source
- 501.3 Exhaust air must be exhausted outside at a point where it will not cause a public nuisance.
- 504.2 Clothes dryer exhaust in fire rated walls to be galvanized steel or aluminum and maintains fire resistance.
- 504.8.1 Domestic dryer duct 4" min.
- 504.8.2 Dryer Exhaust Duct Installation
- 505.1-505.4 Domestic Kitchen Exhaust Equip.
- 507.1.1.1 A single heat sensor cannot be mounted in the common ductwork for commercial kitchen hood systems
- 601.2.1 Corridor ceiling used as plenum if conditions met
- 601.5 Return Air Openings.
- 602.1 No fuel-fired appliances in plenum
- 602.1 Plenum w/in one fire area.
- 602.2.1.5 Discreet plumbing and mechanical products in plenums.
- Table 607.3.2.1 Fire Damper ratings
- 607.5 Fire Dampers req'd at: Fire walls, fire barriers, fire partitions, corridors/smoke barriers, shaft wall, exterior wall, smoke partitions
- 607.3.3.2 Smoke detector req'd within 5' of smoke damper
- 701.2 Dampers installed on combustion air openings shall be interlocked with the appliance to prevent operation when damper is closed
- 802.9 no appliance vent terminals within 12" of door swing.
- 1004.3 18" clearance around boilers
- 1004.3.1 Clearances at top of boilers
- Chapter 14 Solar Systems

IFGC 2015

- 303.3 Appliances not located in sleeping rooms, bathrooms, toilet rooms, storage closets or surgical rooms. Exceptions listed.
- 307.6 Condensate pumps in uninhabitable spaces shall be attached to the appliance serves so in case of failure the appliance can't be operated.
- 309.1 Gas piping cannot be used for grounding electrode.
- 310.1.1 Electrical Bonding of Corrugated Tubing
- 404.3 No piping in ducted supply, return, exhaust, clothes chute, chimney, gas vent, dumbwaiter or elevator shaft
- 404.5 Fittings in concealed locations shall be limited to:
 - Threaded elbows, tees and couplings
 - Welded Fittings
 - Fittings listed to ANSI LC-1/ CSA 6.26 or ANSI LC-4
- 404.7 Piping parallel to or within framing members shall be protected per 404.7.1 to 404.7.3
- 608.4 Vented wall furnace air inlet or outlets cannot be within 12" of door swings.
- 411.1 Appliances shall be connected to the piping system by rigid metallic pipes and fittings, corrugated stainless steel tubing, or listed and labeled appliance connectors
- 411.1.1 Commercial cooking appliances installed on casters and appliances that are moved for cleaning shall be connected to the piping system with and appliance connector.
- 502.7.1 Doors cannot swing within 12" horizontally of a vent terminal. Door stops or closers shall not be used to obtain this clearance
- 503.4.1 Plastic piping used to vent an appliance shall only be used on appliances listed for use with such materials and the appliance manufacturer shall specify a specific material
- 503.8 Venting System Termination Location
- 621.2 Unvented room heaters cannot be the sole source of heating for a dwelling unit.
- 625.1 Refrigerators require 2" clearance behind and 12" above.

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- 101.4.2 State and National Historic places are exempt from this code.
- 101.4.3 Additions, renovations, alterations, repairs shall comply with this code.
- 101.4 Exceptions listed for compliance
- Table 502.2(1) Insulation Requirements
- 502.4.7 Required Vestibule

NEC 2014

- Check calculations on each circuit
- Check calculations on panel
- Load on circuit: 80% max of breaker size
- $W=A \times V$

Assumptions:

Microwave, washer: 1500W

Fridge, Dishwasher, disposal: 1200W

Dryer: 4500W

Exhaust Fan: 150W

- Verify generator disconnect is visible and within 50' of building.

Single line diagram:

- Check conduit/raceway size per conductor:
 - Annex C if all conductors same size
 - Ch 9 Tables 4 & 5 if conductors diff size
 - Don't include ground in calculation
 - If PVC, typ Sch 40 unless in damageable location, then Sch 80
- 110.24 Field marking of available fault current.
- 310 (A) through (C) Indicates if conductor for damp, dry, wet locations
- 300.5 underground locations considered wet
- Table 310.15(B)16 Allowable ampacities of conductors
 - If not designated, assume copper
 - Always use 75 degree column
- Table 250.122 Min. Equipment Grounding Conductor per Rating
 - Use for grounding to panels or other equipment
- Table 250.66 Grounding Electrode Conductor: for service entrance conductors, transformers, generators
 - Look at largest service entrance conductor to determine grounding electrode conductor size
- Table 210.2 Specific-Purpose Branch Circuits
- GFCI not in Dwelling Units:
 - Bathrooms
 - Kitchens
 - Rooftops
 - Outdoors
 - w/in 6' of Sink Edge
 - Indoor Wet Locations
 - Locker Rooms with Showering Facilities
 - Garages/Service Bays
 - Drinking Fountains
- 210.19(A)(1)(a) Min. ampacity = noncontinuous load + 125% of continuous load

— Table 210.21.B.2 Max Load:

Circuit Rating	Max Load
15 or 20	12
20	16
30	24

— Table 210.24 Conductor size per amperage

Circuit Rating	Conductor Ga.
15A	14
20A	12
30A	10
40A	8
50A	6

- 210.62 receptacle w/in 18" of show windows, for each 12'
- 220.14.I Receptacles calculated at $\geq 180W$ per receptacle
- 220.43.B Track lighting calculated at $\geq 150W$ per 2' of track
- 225.39 Disconnect Rating
 - One family dwelling: 100A
 - All others: 60A
- 230.70.A.1 Service disconnect outside building or inside near service entrance.
- 230.70.A.2 No disconnects in bathrooms.
- 240.24.D. No overcurrent devices by easily ignitable material.
- 240.24.E No overcurrent devices in bathrooms
- 240.24.F No overcurrent devices over stairs
- 240.87 Arc Energy Reduction service $\geq 1200 A$
- 250.52 Grounding electrodes:
 - Metal underground water pipe $\geq 10'$
 - Metal building frame, single structural member $\geq 10'$
 - Concrete encased electrode in $\geq 2"$ concrete for $\geq 20'$, 4AWG
 - Ground ring contacting bare earth $\geq 20'$ of 2AWG, 30" below grade
- 250.106 Lightning protection system grounded to building or structure grounding electrode system.
- 406.5.E. Receptacles cannot be installed face up in countertops or work surfaces
- 406.9.C Receptacles cannot be installed w/in or over shower or bathtub
- 406.12 Tamper resistant receptacles in dwelling units
- 410.10.D No lights w/in 8' vertically or 3' horizontally of bathtub rim or shower threshold
- 410.10.D Lights w/in tubs or showers to be marked for damp/wet location
- 410.16.B Closets cannot have open incandescent bulbs

- 410.16.C Min. clearances in closets:
 - 12" for surface mounted LED or Incandescent
 - 6" for surface mounted fluorescent
 - 6" for recessed incandescent or LED
 - 6" for recessed fluorescent
 - No min. for surface mounted fluorescent or LED marked for use
- 411.5.B No receptacles w/in 3' of spas/fountains
- 422.16.B.4 Range hoods can be cord & plug if 18 to 36" cord and individual branch circuit.
- 422.52 GFCI for drinking fountains
- 450.13 Transformer Accessibility
- 511 Commercial Garages, Repair and Storage
- 511.12 GFCI receptacles in service garages for diagnostic equipment, electric hand tools or portable lighting
- 513 Aircraft Hangars
- 513.12 GFCI receptacles in aircraft hangars, same as 511.12
- 514 Fuel Dispensing Facilities
- 520.41 Theater footlights, border and proscenium lights in circuits > 20A
- 551 RV Parks
- 600.5 20A outlet req'd at each entrance to tenant commercial space for signage, for no other load
- 600.5.B.1 Neon tubing branch circuits $\leq 30A$
- 605 Office Furnishings
- 620 Elevators
- 625 Electric Vehicle Charging System
- 640 Audio Equipment
- 645 IT Equipment
- 660 Xray Equipment
- 680 Pools, Spas, Fountains
- 690 PV Systems