PLAN REVIEWS Over-the-counter

1

TODAY'S GOALS

- Reading scales
- Understand Basic structural concepts and terms
- Calculate areas and fees
- Gain confidence to do counter reviews!
- Hands on practice!

2

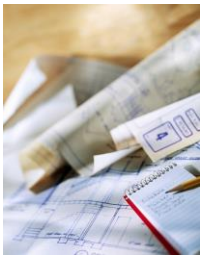
TODAY'S GOALS

- Plan Reviews:
  - Gas pipe sizing
  - Patios
  - Walls and Fencing
  - Pool/spas
  - Accessory structures
  - Enclosures

ASK QUESTIONS!

3

COMPLETE SUBMITTALS



If no checklist, ask yourself-

- **Who** is submitting?
- **What** is the project?
- **Where** is it being built?

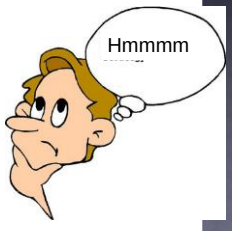
and

- **How** is it being constructed?

4

HOW IS IT BUILT?

- Visualize the project
- Start at the bottom
- Work up to the top
- What else may be needed?
  - Electric ?
  - Plumbing ?
  - Mechanical ?



- Let's start with something easy....

5

POSTS

RAILS

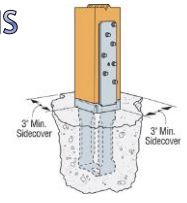
COMPONENT PARTS

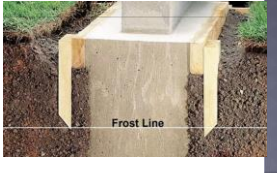
6

BLOCK FENCING

7

FENCE INSPECTIONS



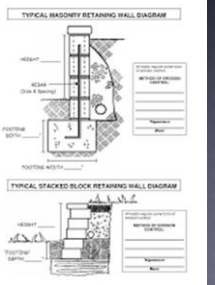


8

BOND BEAM & GROUT

9

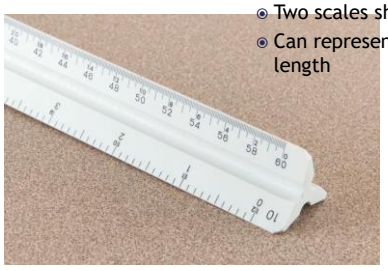
RETAINING WALL



10

ENGINEERING SCALE

- Reads in decimals of a foot
- Two scales share a side
- Can represent any length



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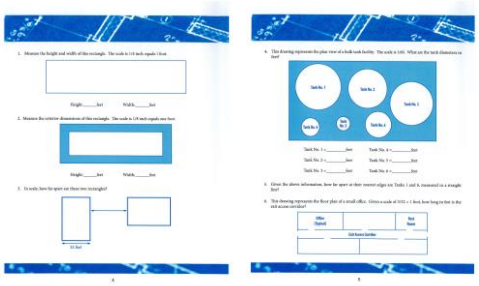
ARCHITECTURAL SCALE

- Measures in feet and inches
- Two scales per side
- Start at the 0- not end of scale

12

PRACTICE



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PATIOS

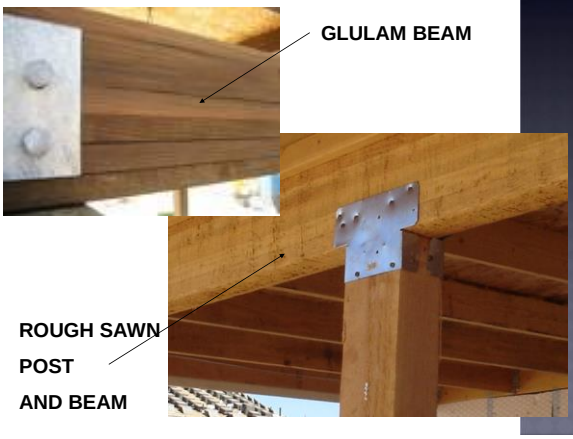
14

PATIO PLAN REVIEW CHECKLIST

- Zoning
- Setbacks
- Dimensions
- Beam and Post sizing
- Rafter / Joist sizing and spacing
- Connections
- Footings

15

16



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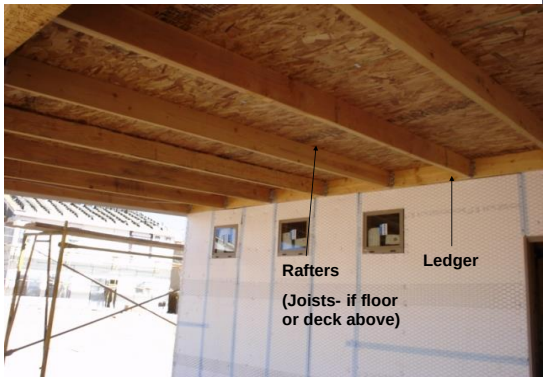
METAL CONNECTORS

18

19

LEDGER AND RAFTERS



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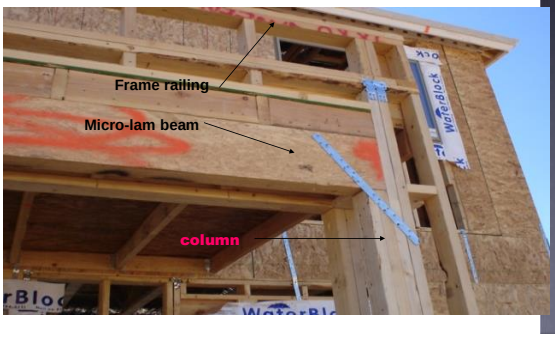
PATIO RAILING @ FRAME COLUMN



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RAFTER CHEAT SHEET

MINIMUM RAFTER SIZES (INCHES)			
Rafter Span in ft.	Rafter Spacing (center to center)		
	12"	16"	24"
10	2 x 6	2 x 6	2 x 6
11	2 x 6	2 x 6	2 x 6
12	2 x 6	2 x 6	2 x 8
13	2 x 6	2 x 8	2 x 8
14	2 x 8	2 x 8	2 x 10
15	2 x 8	2 x 8	2 x 10
16	2 x 8	2 x 8	2 x 10
17	2 x 8	2 x 10	2 x 10
18	2 x 8	2 x 10	2 x 12
19	2 x 8	2 x 10	2 x 12
20	2 x 10	2 x 10	2 x 12

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BEAM CHEAT SHEET

MINIMUM BEAM SIZES (INCHES)								
Post spacing (ft)	Rafter Spans in ft.							
	6	8	10	12	14	16	18	20
4	4 x 4	4 x 4	4 x 4	4 x 4	4 x 4	4 x 4	4 x 4	4 x 6
6	4 x 4	4 x 4	4 x 6	4 x 6	4 x 6	4 x 6	4 x 6	4 x 6
8	4 x 6	4 x 6	4 x 6	4 x 6	4 x 8	4 x 8	4 x 8	4 x 8
10	4 x 6	4 x 8	4 x 8	4 x 8	4 x 10	4 x 10	4 x 10	4 x 10
12	4 x 8	4 x 8	4 x 10	4 x 10	4 x 10	4 x 12	4 x 12	4 x 12
14	4 x 8	4 x 10	4 x 10	4 x 12	4 x 12	4 x 12	4 x 14	4 x 14
16	4 x 10	4 x 10	4 x 12	4 x 12	4 x 14	4 x 14	4 x 16	4 x 16
18	4 x 10	4 x 12	4 x 14	4 x 14	4 x 16	4 x 16	4 x 16	4 x 16
20	4 x 12	4 x 14	4 x 14	4 x 16	4 x 16	4 x 18	4 x 18	4 x 18

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RAFTER SIZING

- Using the IRC Tables
- Chapter 8
  - Conditions (with or without ceiling)
  - Spacing
  - Type of wood

TABLE R802.5.1(1)—continued
RAFTER SPANS FOR COMMON LUMBER SPECIES
(Roof live load=20 psf, ceiling not attached to rafters, L/Δ = 180)

RAFTER SPACING (inches)	SPECIES AND GRADE		DEAD LOAD = 10 psf					DEAD LOAD = 20 psf				
			2 x 4	2 x 6	2 x 8	2 x 10	2 x 12	2 x 4	2 x 6	2 x 8	2 x 10	2 x 12
			Maximum rafter spans[a]									
			(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)	(feet - inches)
24	Douglas fir-larch	SS	9-1	14-4	18-10	23-4	Note b	8-11	13-1	16-7	20-3	23-5
	Douglas fir-larch	#1	8-7	12-6	15-10	19-5	22-6	7-5	10-10	13-9	16-9	19-6
	Douglas fir-larch	#2	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Douglas fir-larch	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Hem-fir	SS	8-7	13-6	17-10	22-9	Note b	8-7	12-10	16-3	19-10	23-0
	Hem-fir	#1	8-4	12-3	15-6	18-11	21-11	7-3	10-7	13-5	16-4	19-0
	Hem-fir	#2	7-11	11-7	14-8	17-10	20-9	6-10	10-0	12-8	15-6	17-11
	Hem-fir	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9
	Southern pine	SS	8-11	14-1	18-6	23-8	Note b	8-11	14-1	18-6	22-11	Note b
	Southern pine	#1	8-9	13-9	17-9	21-1	25-2	8-3	12-3	15-4	18-3	21-9
	Southern pine	#2	8-7	12-3	15-10	18-11	22-2	7-5	10-8	13-9	16-5	19-3
	Southern pine	#3	6-5	9-6	12-1	14-4	17-1	5-7	8-3	10-6	12-5	14-9
	Spruce-pine-fir	SS	8-5	13-3	17-5	21-8	25-2	8-4	12-2	15-4	18-9	21-9
	Spruce-pine-fir	#1	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir	#2	8-0	11-9	14-10	18-2	21-0	6-11	10-2	12-10	15-8	18-3
	Spruce-pine-fir	#3	6-1	8-10	11-3	13-8	15-11	5-3	7-8	9-9	11-10	13-9

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FOOTING CHEAT SHEET

MINIMUM POST FOOTING SIZE (INCHES SQ.) x 12" depth min.								
Post Spacing (ft)	Rafter Span in ft.							
	6	8	10	12	14	16	18	20
4	*	*	*	*	*	*	*	*
6	*	*	*	*	12"	12"	12"	12"
8	*	*	*	12"	12"	14"	16"	16"
10	*	*	12"	14"	14"	14"	16"	16"
12	*	12"	14"	16"	16"	16"	18"	18"
14	12"	12"	14"	16"	16"	18"	18"	20"
16	12"	14"	14"	16"	16"	18"	20"	20"
18	12"	14"	16"	18"	18"	20"	20"	24"
20	14"	14"	16"	18"	20"	20"	24"	24"

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PLYWOOD- OK TO USE EXPOSED

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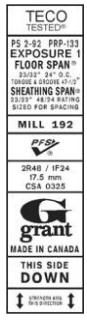
ORIENTED STRANDS BOARD



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CALCULATE PERMIT FEES

- A 26'-0" x 12'-6" patio @ $15 per sq. foot valuation.
- Fees based on valuation:
- Appendix L
- $ 69 for the first $2,000 plus $11.00 for each additional $1,000 or fraction thereof.

28

DECKS

- Structurally the same as a patio
- But…. One big difference
- LIVE LOADS!

29

DECK TABLES- NEW 2018

- 507.3.1- Footing sizes
  - Tributary area, soil bearing value, etc
- 507.5- Beam sizing
  - Joist span
- 507.6- Joist spans
  - Allowed span, cantilever
- 507.7- Decking material
  - Perpendicular or diagonal
- 507.9.1.3 (1)- Deck Ledger connection
  - Spacing, layout

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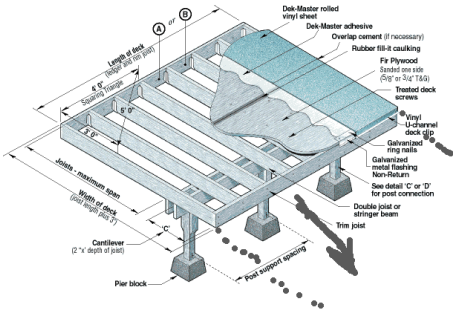
DECK PARTS



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JOISTS TABLE 507.6

TABLE R507.6
DECK JOIST SPANS FOR COMMON LUMBER SPECIES (ft. - in.)

SPECIES	SIZE	ALLOWABLE JOIST SPAN[a] SPACING OF DECK JOISTS (inches)			MAXIMUM CANTILEVER[b,c] SPACING OF DECK JOISTS WITH CANTILEVERS[c] (inches)		
		12	16	24	12	16	24
Southern Pine	2 × 6	9-11	9-0	7-7	1-3	1-4	1-6
	2 × 8	13-1	11-10	9-8	2-1	2-3	2-5
	2 × 10	16-2	14-0	11-5	3-4	3-6	2-10
	2 × 12	18-0	16-6	13-6	4-6	4-2	3-4
Douglas Fir #2	2 × 6	9-6	8-8	7-2	1-2	1-3	1-5
	2 × 8	12-6	11-1	9-1	1-11	2-1	2-3
	2 × 10	15-8	13-7	11-1	3-1	3-5	2-9
	2 × 12	18-0	15-9	12-10	4-6	3-11	3-3
Redwood	2 × 6	8-10	8-0	7-0	1-0	1-1	1-2
	2 × 8	11-8	10-7	8-8	1-8	1-10	2-0
	2 × 10	14-11	13-0	10-7	2-8	2-10	2-8
	2 × 12	17-5	15-1	12-4	3-10	3-9	3-1

mm = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.
ade with wet service factor.
snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360.
snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied to end.
incising factor.
species with no incising factor.
ered spans not exceeding the nominal depth of the joist are permitted.

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BEAMS TABLE 507.5

TABLE R507.5
DECK BEAM SPAN LENGTHS[a, b, c] (feet - inches)

SPECIES[f]	SIZE[e]	DECK JOIST SPAN LESS THAN OR EQUAL TO: (feet)						
		6	8	10	12	14	16	18
Southern pine	1 – 2 × 6	4-11	4-0	3-7	3-3	3-0	2-10	2-8
	1 – 2 × 8	5-11	5-1	4-7	4-2	2-10	3-7	3-5
	1 – 2 × 10	7-0	6-0	5-5	4-11	4-7	4-3	4-0
	1 – 2 × 12	8-3	7-1	6-4	5-10	5-5	5-0	4-9
	2 – 2 × 6	6-11	5-11	5-4	4-10	4-6	4-3	4-0
	2 – 2 × 8	8-9	7-7	6-9	6-2	5-9	5-4	5-0
	2 – 2 × 10	10-4	9-0	8-0	7-4	6-9	6-4	6-0
	2 – 2 × 12	12-2	10-7	9-5	8-7	8-0	7-6	7-0
	3 – 2 × 6	8-2	7-5	6-8	6-1	5-8	5-3	5-0
	3 – 2 × 8	10-10	9-6	8-6	7-9	7-2	6-8	6-4
	3 – 2 × 10	13-0	11-3	10-0	9-2	8-6	7-11	7-6
	3 – 2 × 12	15-3	13-3	11-10	10-9	10-0	9-4	8-10
Douglas fir-larch[f], hem-fir[f], spruce-pine-fir[f], redwood, western cedars, ponderosa pine[f], red pine[f]	3 × 6 or 2 – 2 x 6	5-5	4-8	4-2	3-10	3-6	3-1	2-9
	3 × 8 or 2 – 2 × 8	6-10	5-11	5-4	4-10	4-6	4-1	3-8
	3 × 10 or 2 – 2 × 10	8-4	7-3	6-6	5-11	5-6	5-1	4-8
	3 × 12 or 2 – 2 × 12	9-8	8-5	7-6	6-10	6-4	5-11	5-7
	4 × 6	6-5	5-6	4-11	4-6	4-2	3-11	3-8
	4 × 8	8-5	7-3	6-6	5-11	5-6	5-2	4-10
	4 × 10	9-11	8-7	7-8	7-0	6-6	6-1	5-8
	4 × 12	11-5	9-11	8-10	8-1	7-6	7-0	6-7
	3 – 2 × 6	7-4	6-8	6-0	5-6	5-1	4-9	4-6
	3 – 2 × 8	9-8	8-6	7-7	6-11	6-5	6-0	5-8
	3 – 2 × 10	12-0	10-5	9-4	8-6	7-10	7-4	6-11
	3 – 2 × 12	13-11	12-1	10-9	9-10	9-1	8-6	8-1

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.
a. Ground snow load, live load = 40 psf, dead load = 10 psf, L/Δ = 360 at main span, L/Δ = 180 at cantilever with a 220-pound point load applied at the end.
b. Beams supporting deck joists from one side only.
c. No. 2 grade, wet service factor.
d. Beam depth shall be greater than or equal to depth of joists with a flush beam condition.
e. Includes incising factor.
f. Northern species. Incising factor not included.

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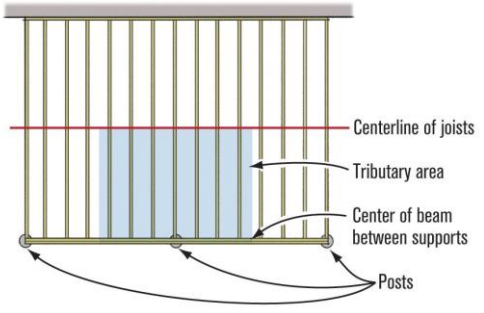
TRIBUTARY AREA



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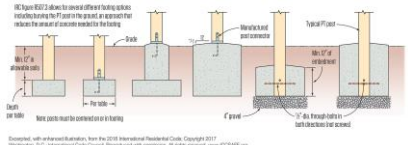
FOOTINGS TABLE 507.3.1

TABLE R507.3.1
MINIMUM FOOTING SIZE FOR DECKS

LIVE OR GROUND SNOW LOAD[a] (psf)	TRIBUTARY AREA (sq. ft.)	LOAD BEARING VALUE OF SOILS[b, c, d] (psf) 1000 psf: Side of a square footing (inches)	1000 psf: Diameter of a round footing (inches)	1000 psf: Thickness (inches)	2000 psf: Side of a square footing (inches)	2000 psf: Diameter of a round footing (inches)	2000 psf: Thickness (inches)	≥ 2500 psf: Side of a square footing (inches)	≥ 2500 psf: Diameter of a round footing (inches)	≥ 2500 psf: Thickness (inches)	≥ 3000 psf: Side of a square footing (inches)	≥ 3000 psf: Diameter of a round footing (inches)	≥ 3000 psf: Thickness (inches)
40	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	14	16	6	12	14	6	13	14	6	12	14	6
	60	17	19	6	15	17	6	13	15	6	12	14	6
	80	20	22	7	17	19	6	15	17	6	14	16	6
	100	22	25	8	19	21	6	17	19	6	15	17	6
	120	24	27	9	21	23	7	18	21	6	17	19	6
	140	26	29	10	23	25	8	20	23	7	18	21	6
	160	28	31	11	24	27	9	21	24	8	20	22	7
50	20	12	14	6	12	14	6	12	14	6	12	14	6
	40	15	17	6	13	15	6	12	14	6	12	14	6
	60	19	21	6	16	18	6	14	16	6	13	15	6
	80	21	24	8	19	21	6	17	19	6	15	17	6
	100	24	27	9	21	23	7	19	21	6	17	19	6
	120	26	30	10	23	26	8	20	23	7	19	21	6
	140	28	32	11	25	28	9	22	25	8	20	23	7
	160	30	34	12	26	30	10	24	27	9	21	24	8
60	20												6
	40												6
	60												6
	80												6
	100												6

Use Less Concrete

IRC figure R507.3 allows for several different footing options including burying the PT post in the ground, an approach that reduces the amount of concrete needed for the footing



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TYPES OF FOOTINGS

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LEDGER TABLE 507.9.1

Ledger to be same size as joist or one size larger

TABLE R507.9.1.3(1)
DECK LEDGER CONNECTION TO BAND JOIST[a, b]
(Deck live load = 40 psf, deck dead load = 10 psf, snow load ≤ 40 psf)

CONNECTION DETAILS	JOIST SPAN						
	6' and less	6'1" to 8'	8'1" to 10'	10'1" to 12'	12'1" to 14'	14'1" to 16'	16'1" to 18'
	On-center spacing of fasteners						
½-inch diameter lag screw with ½-inch maximum sheathing[c, d]	30	23	18	15	13	11	NP
½-inch diameter bolt with ½-inch maximum sheathing[d]	36	36	34	29	24	21	NP
½-inch diameter bolt with 1-inch maximum sheathing[d]	36	36	29	24	21	18	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.
b. Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.

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HEIGHT OF POSTS

TABLE R507.4
DECK POST HEIGHT[a]

DECK POST SIZE	MAXIMUM HEIGHT[b, c] (feet-inches)
4 × 4	6-9
4 × 6	8
6 × 6	14
8 × 8	14

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.
a. Measured to the underside of the beam.
b. Based on 40 psf live load.
c. The maximum permitted height is 8 feet for one-ply and two-ply beams. The maximum permitted height for three-ply beams on post cap is 6 feet 9 inches.

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IF OVER 30" ABOVE GRADE FOLLOW R 311.7.5.1 & .2

40

ADDITIONAL ITEMS

- Railing required if over 30" above grade
- Steps needed?
- If a balcony, there may be electric required
  - Light
  - Outlet

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GAS PIPE SIZING

- Easy to size!
- 3 different methods
  - Branch length- Easiest!!!

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APPLIANCE DEMAND

No longer in IRC !

Conversion Factor:
BTU/Hr
To
Cu. Ft./Hr
1/1100

TABLE G2413.2 (402.2)
APPROXIMATE GAS INPUT FOR TYPICAL APPLIANCES

APPLIANCE	INPUT BTUH (Approx.)
Space Heating Units	
Hydronic boiler	
Single family	100,000
Multifamily, per unit	75,000
Warm-air furnace	
Single family	100,000
Multifamily, per unit	60,000
Space and Water Heating	
Hydronic boiler	
Single family	120,000
Multifamily, per unit	75,000
Water Heating Appliances	
Water heater, [illegible] instantaneous	
Capacity at [illegible] gallons per hour	142,800
Capacity at [illegible] gallons per hour	285,000
Capacity at [illegible] gallons per minute	428,400
Water heater, automatic storage, 30- to 40-gal. tank	35,000
Water heater, automatic storage, 50-gal. tank	50,000
Water heater, domestic, circulating or side-arm	35,000
Cooking Appliances	
Built-in oven or broiler unit, domestic	25,000
Built-in top unit, domestic	40,000
Range, free-standing, domestic	65,000
Other Appliances	
Barbecue	40,000
Clothes dryer, Type 1 (domestic)	35,000
Gas fireplace, direct vent	40,000
Gas light	2,500
Gas log	80,000
Refrigerator	3,000

For SI: 1 British thermal unit per hour = 0.293 W, 1 gallon = 3.785 L, 1 gallon per minute = 3.785 L/m.

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NEED TO KNOW

- Length (furthest run of pipe)
- Demand of all appliances (BTU or CFH)
- Type of pipe material
  - Schedule 40 Metallic Pipe
  - Semi-rigid Copper Tubing
  - Corrugated Stainless Steel Tubing**
  - Plastic

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TYPE OF PIPE TABLES

TABLE G2413.4(1) [402.4(2)]
SCHEDULE 40 METALLIC PIPE

Gas	Natural
Inlet Pressure	Less than 2 psi
Pressure Drop	0.5 in. w.c.
Specific Gravity	0.60

PIPE SIZE (inch)														
Nominal	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Actual ID	0.622	0.824	1.049	1.380	1.610	2.067	2.469	3.068	4.026	5.047	6.065	7.981	10.020	11.938
Length (ft)	Capacity in Cubic Feet of Gas per Hour													
10	172	360	678	1,390	2,090	4,020	6,400	11,300	23,100	41,800	67,600	139,000	252,000	399,000
20	118	247	466	957	1,430	2,760	4,400	7,780	15,900	28,700	46,500	95,500	173,000	275,000
30	95	199	374	768	1,150	2,220	3,530	6,250	12,700	23,000	37,300	76,700	139,000	220,000
40	81	170	320	657	985	1,900	3,020	5,350	10,900	19,700	31,900	65,600	119,000	189,000
50	72	151	284	583	873	1,680	2,680	4,740	9,660	17,500	28,300	58,200	106,000	167,000
60	65	137	257	528	791	1,520	2,430	4,290	8,760	15,800	25,600	52,700	95,700	152,000
70	60	126	237	486	728	1,400	2,230	3,950	8,050	14,600	23,600	48,500	88,100	139,000
80	56	117	220	452	677	1,300	2,080	3,670	7,490	13,600	22,000	45,100	81,900	130,000
90	52	110	207	424	635	1,220	1,950	3,450	7,030	12,700	20,600	42,300	76,900	122,000
100	50	104	195	400	600	1,160	1,840	3,260	6,640	12,000	19,500	40,000	72,600	115,000
125	44	92	173	355	532	1,020	1,630	2,890	5,890	10,600	17,200	35,400	64,300	102,000

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SIZING A SINGLE APPLIANCE

BBQ

1. Length of pipe
   (52 ft) round #'s up to match table
2. Fuel demand of BBQ (45k btu) in CFH
3. Determine pipe type- Schedule 40
4. Read table to determine size of pipe

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GAS LOG SET-

- Demand is 80k btu
- Length of run = 92 feet
- Copper tubing Type K
- Size of pipe?

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SIZING MULTIPLE APPLIANCES

BBQ (45k btu), Fire Pit (75k btu) and Spa Heater (125k btu)

1. Furthest length of pipe
2. Total fuel demand of appliances
3. Configuration
   -single line or branched off?
4. Pipe type- Schedule 40
5. Read Table to determine size(s)

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PRESSURE TEST

- 1 ½ x gas pressure in pipe but not less than 3 psi.
- Hold pressure for 10 minutes

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GAS FAST FACTS

- Must be all pipe new! Or previously used for gas only
- Can't run thru air ducts, chimneys, vents
- Crawl space or outdoor pipes- located above ground or floor- must be supported/secured
- Shutoffs readily accessible- within 6'

- **Do Not** bury under building slab!
  - EXC- OK if sleeved in schedule 40 steel, iron or plastic pipe

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POOL CONSTRUCTION

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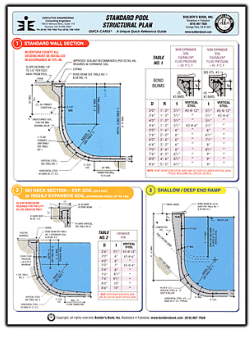
STANDARD PLANS



What else could have standard plans on file?

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SWIMMING POOL AND SPA CHECKLIST

- Application
- Site or Plot plans
  - -- Location w/dimensions
  - Depths
  - Utility Locations
  - Easements
  - Extra features
  - Existing buildings
- Pool engineering/ standards
- Barrier requirements
  - Appendix G

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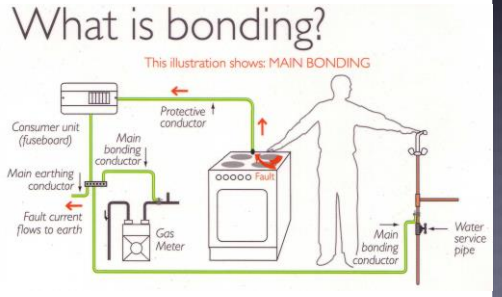

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BONDING TO GAS AND WATER LINES

Water Bond

Gas Bond

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NEW POOL ISSUES EQUIPOTENTIAL BONDING OF DECK

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ANTI- ENTRAPMENT
SUCTION VACUUM RELIEF SYSTEM

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ENTRAPMENT PROTECTION

Virginia Graeme Baker Act
Effective Dec. 19, 2009

ASME/ANSI A112.19.8-2007
Approved Drain Covers and Sumps

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POOL BARRIERS

Any SFD must have at least one option:

1. Isolated by an pool fence
2. Approved cover
3. Exit alarms on house
4. SC/SL doors on house
5. Alarms at pool water level
6. Alternate options that are more restrictive than State laws

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SPAS

- Simple electrical or gas permit?
- Things to look for:
  - GFCI outlet
  - Windows or glass within 5 ft
  - Other existing conditions
    - What is it sitting on? Ground? Deck? Patio?
  - Barriers
    - Spa lid

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GARAGE CONVERSIONS & CARPORT ENCLOSURES

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KEY ITEMS TO WATCH FOR

- Window area
  - Anything being covered up?
- Openable window area
- Electrical/Mechanical
- Protection of wood framing
  - Distance to grade
- Existing equipment
  - Water heaters
  - Mechanical equipment- furnaces

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ELECTRICAL REQUIREMENTS

- Outlet spacing
  - Every 12 lineal feet
  - Wall sections 24" wide
  - 4 ft at kitchen counters
- Where are lights required?
- Switches?

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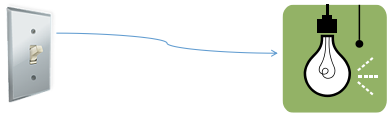
ELECTRICAL

- Required lights with switches
  - Bedrooms, Bathrooms, Stairs, Exterior, attached garages, detached garages with power



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OUTLETS

- GFCI - Ground Fault Circuit Interrupter
- Water/ water pipes create a second 'ground' for the electrical current.

Where required?

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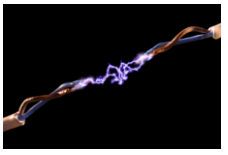
AFCI- ARC FAULT



- Arcing of current due to frayed or broken cords, overloaded outlets or extension cords.
- Senses uneven flow of electrical currents
- E3902
- Where required?

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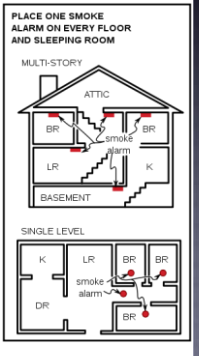
SMOKE DETECTORS

- Every bedroom
- Hallway outside of bedrooms
- Each floor level of a house
- Interconnected with battery back-up



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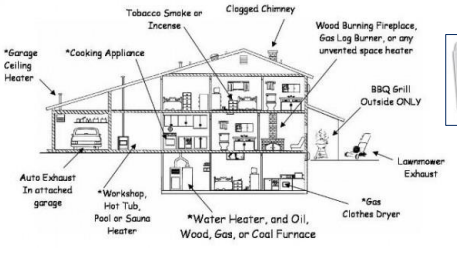
CARBON MONOXIDE DETECTORS

- Required where gas appliances are present
- Garages attached to house



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MECHANICAL REQUIREMENTS

- Heating must be supplied to habitable rooms
  - Add to existing or new or portable unit?

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DETACHED AND ACCESSORY STRUCTURES

- Not the main use of the property
- Not attached to the main building

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LET'S LOOK AT DETACHED STRUCTURES!

Zoning issues
Lot Coverage
Separations
Distance to Property lines

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ELECTRICAL PLUMBING MECHANICAL DO'S AND DON'T'S

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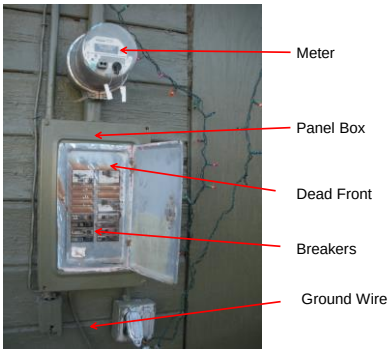
ELECTRICAL PANEL



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PANEL OPEN

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QUESTIONS?

Mary Dickson, CBO
mdickson@litchfield-park.org

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