

Project Memorandum

Date: December 8, 2015
To: Lee Geiger
From: Gary Kuhl, PE

Project: Phatty McGees
Project No.: 15054

Re: Plumbing Calculations

Skyline Engineering was asked to review the capacity of the existing plumbing systems at the Phatty McGees building located at 321 7th Street in Rapid City, SD.

Documentation provided to us by your office includes the following:

- Plumbing calculations provided by Streamline Plumbing;
- Anticipated future use (restaurant in basement, restaurant on 1st Floor, and a total of 7 apartments on 2nd and 3rd Floors).

Conversations with Streamline Plumbing indicate waste piping visible within the existing building is sloped at 1/4" per foot. Refer to the attached table for fixture unit totals based on the fixture breakout given by Streamline Plumbing with the addition of showers for the apartments that appeared to be missing from the Streamline summary.

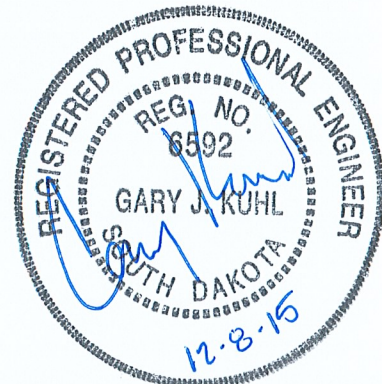
Note there are a few open questions:

1. If apartments will have individual water heaters, additional floor drains will need to be added.
2. Are there floor drains located in mechanical rooms not on fixture list provided?
3. Will there be a dishwasher pre-rinse sink with disposer not on fixture list provided?

Summary

Proposed fixtures total **169 drainage fixture units**. A 4" sanitary sewer line exiting the building will handle a maximum loading FU of 172 based on a pipe slope of 1/8" per foot slope, and 216 based on 1/4" per foot slope.

Proposed fixture total **320.5 water supply fixture units**. This correlates (mix FV and FT system) to approximately 105 gpm peak. We do not know the street pressure, so a definitive service size cannot be provided; however we estimate the requirement to be 2" to 2-1/2" in size.



FIXTURE_BATHROOM GROUPS

Skyline Engineering, LLC

Job Name: Fatty McGees Remodel
 Date: 12/8/2015
 By: AGA
 Checked By: GJK
 Comm #: 15054

FIXTURE UNIT COUNT (BATHROOM GROUPS)

FIXTURE	QTY	WFU	WSFU(SERVICE)	CW 75%	HW 75%	DWF	Total DWF
INDIVIDUAL DWELLING UNITS							
Bathroom Groups having 1.6 GPF Gravity-tank Water Closets							
Half-bath or Powder Room		3.5		---		3	
1 Bathroom Group	7	5	35	---	26.25	5	35
1-1/2 Bathrooms		6		---		6	
2 Bathrooms		7		---		7	
2-1/2 Bathrooms		8		---		8	
3 Bathrooms		9		---		9	
Each Additional 1/2 Bath		0.5		---		0.5	
Each Additional Bathroom Group		1		---		1	
Addition Lavatories	2	1	2	---	1.5	1	2
Kitchen Group (Sink and Dishwasher)	7	2	14	---	10.5	2	14
Clothes Washer	7	4	28	---	21	3	21
SERVING 3 OR MORE DWELLING UNITS							
Bathroom Groups having 1.6 GPF Gravity-tank Water Closets							
Half-bath or Powder Room (one wc and one lav)		2.5		---		2	
1 Bathroom Group (one wc, one lav, one tub or shower)		3.5		---		3	
1 Bathroom Group (one wc, two lav's, one tub or shower)		3.5		---		3	
Bar Sink		1				1	
Whirlpool Bath or Combination Bath/Shower		4				3	
Shower		2				2	
COMMERCIAL FIXTURES							
Water Closet, 1.6 GPF Gravity Tank		2.5				4	
Water Closet, 1.6 GPF Flushometer Valve (with fv adder)	9	10	155	155		4	36
Urinal, 1.0 GPF	4	5	53	53		2	8
Lavatory	13	1	13	9.75	9.75	1	13
Lavatory in Sets of two or three		1				2	
Mop Sink	1	3	3	2.25	2.25	3	3
Culinary Prep Sink	1	1.5	1.5	1.125	1.125	2	2
3 comp pot sink scullery	1	3	3	2.25	2.25	4	4
Kitchen Sink, domestic, with dishwasher		1.5				3	
Kitchen Sink, domestic, with food waste grinder and dishwasher		1.5				3	
Service Sink or Mop Basin	1	3	3	2.25	2.25	3	3
Dishwasher pre-rinse sink with disposer		3				2	
Hose Bibb		2.5					
Drinking Fountain or Watercooler		0.5				0.5	
Commercial Dishwasher	1	10	10		10	4	4
2" Floor Drain	8					2	16
2" Floor Sink						2	
4" Floor Sink	2					4	8
TOTAL	64		320.5	225.63	86.875		169

* Indicates flow taken at 100% only

TOTAL GPM