The following is a definition of the plumbing work to be done in Baskin Engineering Building, Room 288, 292 and 286 to support CO2, Natural Gas and vacuum connections for Prof Phil Berman’s lab.

1. CO2 Supply (BE-288 & BE-286)

   CO2 supply piping originating from a gas cylinder manifold located in BE-286 and routed to room BE-288. The gas cylinder manifold will be installed by the gas supply company (Praxair) prior to start of this job.

   The supply piping once inside BE-288 will connect:
   - two (2) Bio-safety Cabinet (BSC) along West Wall
   - Three (3) dual (stacked) incubators locations along the West Wall. Northwest corner location may use 1 regulator for the two stacks.
   - A single location along the North Wall to have a capped threaded piping connection (may be one side of a threaded T) for future use by a dual stacked incubator (4th incubator stack).
   - An analog pressure gage is to be installed on the main piping run within BE-288 and mounted on North Wall. The gage range should be approximately 0-50 PSI or such that 30PSI registers in the middle third of the gage range. This pressure gage allows lab staff to verify CO2 pressure is available for lab equipment maintaining cell cultures.

Locations for piping runs and all fixtures to be marked/labeled to assist plumbers’ installation.

Specifications and Features.
   a. All piping to be K-Copper, Oxygen clean, pressure of line expected to be 30 PSI. Piping should be 1/2 in for main run into lab but may be 1/4 in for branch lines to devices. Piping inside lab should be surface mounted to wall with path taking route as shown in blue masking tape put up by lab staff. Routing is defined to avoid future interference problems.
   b. For incubator locations, mount to the wall single-stage adjustable pressure regulators (two locations). One location will handle incubators on the South-West Corner of the lab, the other the North-West Corner of the lab. Regulator adjustment should be from 0 to full supply pressure (0-50 psi is ideal). The CONCOA 405 series single stage brass line regulator was recommended by Praxair, but an equal substitution is OK. (www.concoa.com).

   Note: CONCOA 405 has a pressure gage and large knob. Ranges come in 0-15, 0-50, 0-100, 0-250 and higher. Max input pressure is 3000PSIG Inlet connections are 1/4in FPT, 1/8”, ¼” or 3/8” tubing. Outlet assemblies; ¼” FPT port, ¼” MPT, 1/4. 1/8, 3/8 tube fittings

   At the North-West Corner incubator location after the output of the pressure regulator install a T and branch off to two quarter-turn Swaglock isolation valves. These
valves will be used for isolation of the two each dual stacked incubators. The outlet of the valve should mate with a connection for polypropylene flexible tubing. The flexible tubing has a T will be used to make final connection to the 2 incubators in the stack.

At the South-West Corner incubator location after the output of the pressure regulator install a quarter-turn Swaglock isolation valve. This valve will be used for isolation of one each dual stacked incubators. The outlet of the valve should mate with a connection for polypropylene flexible tubing. The flexible tubing has a T and will be used to make final connection to the 2 incubators in the stack.

c. At each of the two (2) Bio-Safety Cabinet (BSC) locations, connect a branch CO2 line via a quarter turn Swagelok valve mounted to the wall. The valve will provide isolation of the BSC. The outlet of the valve should connect via flexible tubing to the plugged penetration connection (CGA320, need to confirm) on the right hand side of the cabinet. Interior to the BSC, install a single turret similar to that already existing for vacuum line. Pressure regulator installation for CO2 to the BSC locations is not required.

2. Vacuum Connection of Bio-Safety Cabinets (BE-288)
Connect two (2) Bio-Safety cabinets (BSC) located in room BE-288 to house vacuum lines located in ceiling. Vacuum piping may be surface mounted along wall in BE-288 but should take the route taped out in advance by the lab staff in order to avoid future interference issues. Install a wall mounted isolation valve and connect vacuum to the BSCs via flexible tubing. Connection at BSC is a threaded pipe connector located on the right side of the BSC. This threaded connection goes to existing valve turret connection inside BSC.

3. Natural Gas Connections at Lab Island Bench tops (BE-288 & BE-292)
Install lab natural gas fixtures at four (4) island lab benches total (2 each in BE-288 and BE-292).
Specifications and Features.
a. Connection to building gas is above drop ceiling tiles. Each lab should have a separate branch connection. Gas branch lines should not run from one lab to another.
b. Each branch natural gas connection shall have an isolation shutoff valve near connection with building gas to isolate the branch line to the benches.
c. Natural gas turrets installed on the island benches should be of the same type as that installed already for air and vacuum. This should be a bench top mounted single-turret, 2-way, 180 degree, bench mounted lab gas fixture
d. The dual headed gas turret to be installed as close to the bench center as possible.
e. Piping run from ceiling to benches may be visible or may be installed inside vertical utility chase for benches. However the piping should not be exposed to or protrude into the isle way. Gas piping routing in bench areas shall route under bench-top and not on top to the turret location.
The drawing below shows the locations of the various utilities to be installed.