

**Mcmaster Nuclear Reactor**  
Frank Saunders, Manager  
**General Orientation**

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**Model of McMaster Nuclear Reactor and Nuclear Research Building**



# McMaster Nuclear Reactor

## General Orientation

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### **Purpose:**

Provide insight into what a research reactor looks like, how it is run and made secure.

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## General Orientation

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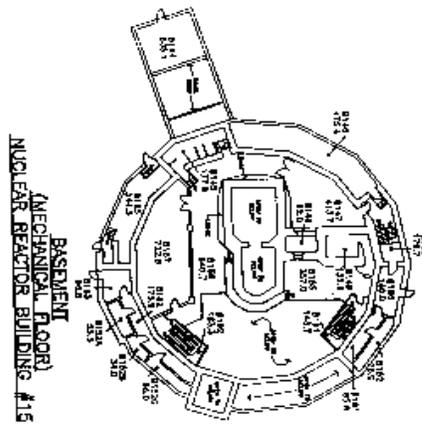
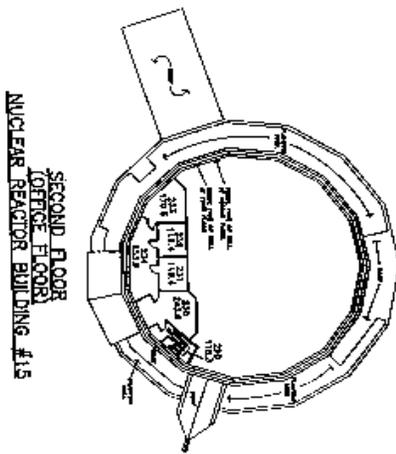
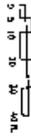
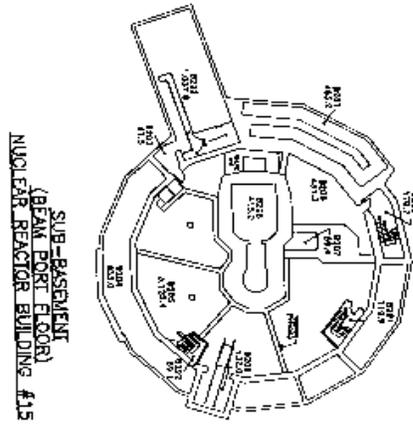
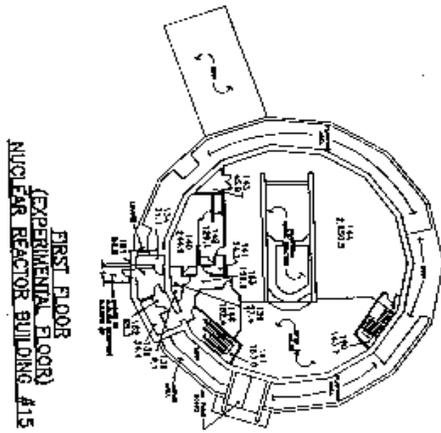
### General Information:

- ▶ **American Machine & Foundry design - 1958**
- ▶ **Operates up to 5 megawatts thermal power**
- ▶ **Pool type - Materials Test Reactor**
- ▶ **Highly Enriched Fuel - 94%; changing to Low Enriched - < 20%**
- ▶ **Full containment building**
- ▶ **Building is approximately 2 feet reenforced concrete**
- ▶ **Three personnel doors and one cargo door only entrances through building**
- ▶ **Each entrance is through an airlock with two steel doors**
- ▶ **Eighteen staff**
- ▶ **Operating 80 hours per week**
- ▶ **Radioactive labs are in Nuclear Research Building**

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### Reactor Building Layout



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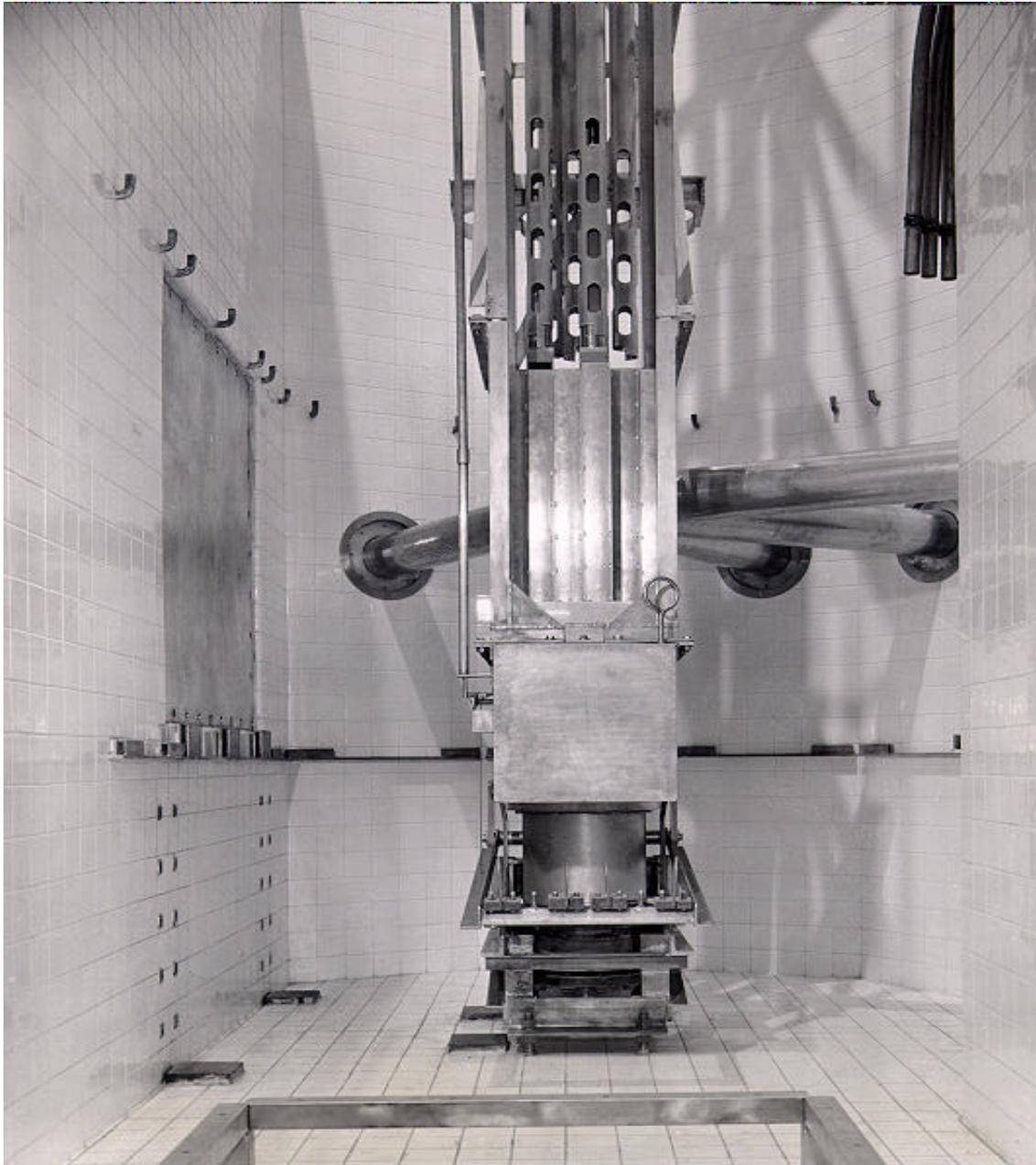
**Reactor pool as seen from above**

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**MNR core and support structure in north pool as seen from bottom of south pool**



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**Exterior of MNR Pool and Beam Ports as seen from North End**

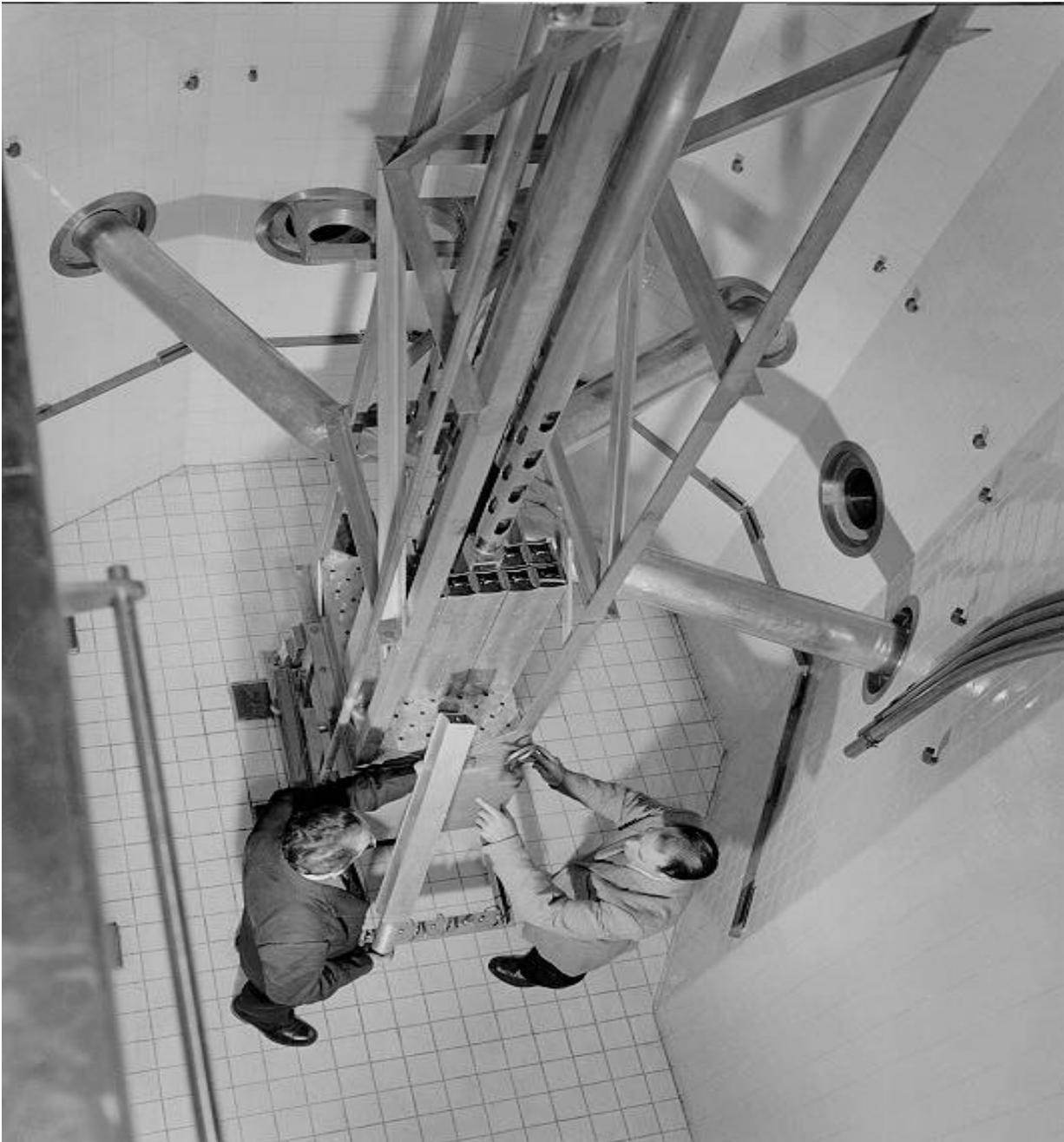


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### **MNR core in normal position at bottom of North Pool**



**Security and Access Control:**

- ▶ **Physical security provisions are mandated under the Physical Security Regulations of the Atomic Energy Control Act**
- ▶ **All entrances to the reactor are locked or under surveillance at all times**
- ▶ **Reactor facilities are monitored by a state of the art security system with local and remote alarms**
- ▶ **Access to the reactor is permitted through only one door (ramp). An electronic card key plus an electronic signal from the security guard (reception) is required to open the entrance door**
- ▶ **To be granted unescorted access to the facility each individual must: have a valid reason for requiring reactor access, provide proof of identity, be approved by the reactor manager, have a reactor familiarization tour, complete radiation safety training, be issued a picture badge and electronic key, and be issued a dosimeter.**
- ▶ **Federal government security clearance is required for all permanent staff**
- ▶ **Card keys and identification badges are issued with expiry dates consistent with the planned work**
- ▶ **All visitors must be escorted by approved personnel**

**Visitor Conduct in MNR:**

- ▶ **While in the reactor remain with your guide at all times**
- ▶ **Do not pick up objects unless given permission by your guide**
- ▶ **Do not remove anything from the reactor building without permission**
- ▶ **Sounding of Evacuation Horn (loud horn) or Fire Alarm (bell). If either of these alarms should sound, do not panic, follow directions of your guide to exit the building. Both these alarms are designed to provide more than adequate time to leave the building safely. Stairways are provided with an external fresh air supply to protect you from smoke or other hazardous material.**
- ▶ **Local alarms. Several types of local alarms exist in the building; some indicate hazards while some are simply timers. Should an alarm sound in your immediate area remain calm, move away from the alarm, and draw your guides attention to the alarm. Follow your guides instructions.**

# **Mcmaster Nnuclear Reactor**

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### **How to Contact MNR:**

- ▶ **By telephone through receptionist at (905) 525-9140 extension 23270**
- ▶ **By facsimile at (905) 528-4339**
- ▶ **By electronic mail at reactor@mcmaster.ca**
- ▶ **By regular mail at**  
**McMaster University**  
**McMaster Nuclear Reactor**  
**1280 Main Street West**  
**Hamilton, Ontario**  
**L8S 4K1**

**TYPICAL CUSTOMER SERVICES:**

- ▶ **Education**
- ▶ **Research**
- ▶ **Radioisotope Production (I-125, Au-198)**
- ▶ **Neutron Activation Analysis of Short Lived Isotopes (Cl, Al, Na)**
- ▶ **Neutron Irradiation of Samples (Geological, Argon Dating, Sources, Isotope Research)**
- ▶ **Gamma Irradiations (Space/Nuclear Plant Environment Testing, Sterilization)**
- ▶ **Neutron Radiography - Nray (Aircraft Engine Turbine Blades)**
- ▶ **Neutron Beams (Neutron Diffraction)**
- ▶ **Prompt Gamma and Delayed Neutron Counting (Gd, Sm, U)**