

ROCKY FLATS PLANT, FINAL ASSEMBLY AND
SHIPPING
(Building 91) (Plant D) (Building 991)
Eastern portion of Plant site, south of Spruce Ave., east
of 10th St., & N. of Central Ave.
Golden vicinity
Jefferson County
Colorado

HAER No. CO-83-U

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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
1849 C St. NW
Washington, DC 20240

HISTORIC AMERICAN ENGINEERING RECORD

ROCKY FLATS PLANT,
FINAL ASSEMBLY AND
SHIPPING FACILITY
(Rocky Flats Plant, Building 991)
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Location: Rocky Flats Environmental Technology Site, Highway 93, Golden, Jefferson County, Colorado. Building 991 is located in the eastern portion of the Rocky Flats Plant (Plant). The building is located south of Spruce Avenue, east of Tenth Street, and north of Central Avenue.

Significance: This building is a primary contributor to the Rocky Flats Plant historic district, associated with the United States (U.S.) strategy of nuclear military deterrence during the Cold War, a strategy considered of major importance in preventing Soviet nuclear attack. Building 991, the first building constructed at the Plant. Building 991 was designed for shipping and receiving and for final assembly of weapon components. Plutonium, enriched uranium, and depleted uranium components fabricated on-site, along with components manufactured from the Hanford Site and Oak Ridge Reservation were assembled into final products, inspected, tested, and placed back in storage prior to off-site shipment in Building 991. Administrative services for the Plant were also carried out in Building 991 until Building 111 was completed in 1953.

Description: Building 991 is a rectangular, concrete, one-story structure encompassing approximately 40,600 square feet (35,400 square feet on the first floor, and 5,200 square feet in the basement). Three major additions have been built since the original construction in 1952: a loading dock on the west side in 1957, a radiography vault in the northwest corner in 1959, and a covered loading dock and storage area on the southeast side in 1964.

The building is set on a concrete foundation with a partial basement. The foundations are composed of footings (individual spread footings, combined footings, and wall footings) and foundation walls.

The exterior walls and intermediate concrete columns constitute the structural framing for the building. The exterior walls contain reinforced concrete, varying in thickness from 12 to 18". The building walls vary in height from 14' on the south, to 27' in the center, to 18' on the north side. Interior bearing walls are reinforced concrete. The walls of the covered dock and shop located at the eastern end of the structure are constructed of reinforced concrete. Four feet of the walls are above-grade.

Depending on the location and function, four different roof types are present. These roof types include reinforced concrete slab supported by concrete beams, structural steel roof frame covered

with corrugated asbestos, open-web steel with metal decking, and reinforced cement. Ceilings consist mostly of the undersides of the various roofs.

Doors in the building are either hollow metal or wood. The south wing of the structure contains the only windows (multi-paned within metal sashings).

Building 991 is the main structure of the 991 complex. Additional structures in the complex include three underground tunnels (Tunnels 996, 997, and 998), four underground vaults (Vaults 996, 997, 998, and 999), a guard post (Building 992), an emergency generator building (Building 989), and a filter plenum building (Building 985). Vaults 996, 997, 998, and 999 are connected to the building via Tunnels 996, 997, and 998. Tunnels and vaults in the complex are maintained at a slight negative air pressure by the building heating, ventilating, and air conditioning system.

Support operations located in Building 991 included laboratories, utilities, and maintenance operations. The metallurgical laboratory, located in Rooms 109, 110 and 111, was used to perform metallographic analysis. A modular laboratory was located in Room 143. This area supported the inspection of glove box gloves and supplied air-breathing garments. Maintenance alarms are located in Rooms 140 and 141. The utilities groups, located in Rooms 130 and 137, operated the building ventilation system.

In terms of operation, the building was divided into the following areas: north of the main floor, center section, and south side.

North of the Main Floor: The north side of the main floor contained a storage area for packed plutonium, enriched uranium, and depleted uranium components fabricated at the Plant and received from other U.S. Department of Energy (USDOE) facilities; packaged final assemblies of nuclear weapon triggers; and incoming raw nuclear materials certified for distribution. Room 150 was used as a storage vault for radioactive materials; Room 158 was used for document storage.

Center Section: The center section of the main floor, between the north and south corridors, contains a covered loading dock at either end. The east loading dock has a small room for maintenance storage. Specialized rooms within the building include: Room 130, which houses most of the building utility equipment; Room 134, which contains facilities for metal machining and ultrasonic non-destructive testing; Room 137, the boiler room; and Room 166, which houses a non-destructive test area for barrels, liners, and waste boxes used for shipping.

South Side: The southern end of the building contains administrative offices, plant protection and safe secure transport personnel offices, and non-destructive testing areas.

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History: The Plant was originally divided into four separate areas: Plant A (Building 444, depleted uranium), Plant B (Building 881, enriched uranium), Plant C (Building 771, plutonium), and Plant D (Building 991, assembly and shipping). Building 991, constructed between 1951 and 1952, was the first to be completed.

Building 991 was designed for shipping and receiving and for final assembly of weapon components. Plutonium, enriched uranium, and depleted uranium components fabricated on-site, along with components manufactured from the Hanford Site and Oak Ridge Reservation were assembled into final products, inspected, tested, and placed back in storage prior to off-site shipment in Building 991. Administrative services for the Plant were also carried out in Building 991 until Building 111 was completed in 1953.

Initially, radioactive components were coated in nickel or encased in plastic allowing assembly of the early concept design products in open rooms, not in enclosed glove boxes or B-boxes (similar to a lab hood). In 1957, production began on a new weapon design, requiring changes in the amount of materials used in the trigger, the amount of machining and handling required, and the need for tighter controls. Because of the new design, final trigger assembly took place in the newly constructed Building 777. Assembly of older uranium-based weapons continued in Building 991 until the 1960s. A limited number of plutonium-based triggers may have been assembled in Building 991 during the early 1960s.

After 1957, the mission of Building 991 focused on shipping, receiving, and storage. Materials handled included special nuclear, non-radioactive raw, and classified materials, other metal components, partially finished products, purchase order items, special order items, samples, instruments, and documents. All radioactive materials received and stored in Building 991 were in Department of Transportation, USDOE, or intraplant-approved shipping containers. For a brief period of time, between 1975 and 1976, shipping was moved to Buildings 439 and 440. Due to security concerns, shipping was moved back to Building 991 after 1976.

In addition to material shipping, receiving, and storage, a number of research and development projects were conducted in Building 991 from the 1960s to the mid-1970s. These projects included radiation studies, beryllium coating processes, and an explosives-forming project. Most special projects and research and development operations were moved out of the building by 1976.

Building 991 was used to test the quality of non-nuclear raw material and non-nuclear non-classified parts fabricated by off-site vendors. A metallography laboratory was used for the testing. In the mid-1970s, Building 991 took over storage and inventory functions from Building 881 for these non-nuclear raw materials and non-nuclear, non-classified parts. In the late 1980s, handling of non-classified materials parts was moved to Buildings 130 and 460. Materials and parts ready for assembly were moved directly to Building 460.

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Until the mid-1980s, materials were shipped and received from the eastern dock areas (Room 166). The west dock was added in the mid-1980s to provide a covered shipping area specifically designed for the safe secure transports used to ship production materials.

Until 1994, when a special loading dock was added to Building 371, Building 991 had the only shipping/receiving dock at the Plant capable of handling off-site shipments of special nuclear and classified materials. The building also housed non-destructive testing operations and other support operations. Radioactive and non-radioactive raw materials, special order items, packaging items, components, and samples were stored in the Building 991 vaults. All non-nuclear and nuclear materials sent to Building 991 were handled in Rooms 170 (shipping dock) and 134. Primary materials handled include 55-gallon and 30-gallon drums of uranium and plutonium parts from off- and on-site parts.

The final activity in Building 991 was waste storage.

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